DECEMBER 1952

ARMY INFORMATION DIGEST

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In This Issue:

★

WORLD'S HOPE. "The real issues are whether the power of Western civilization, as God has permitted it to flower in our own beloved land, shall defy and defeat Communism; whether the rule of men who shoot their prisoners, enslave their citizens and deride the dignity of man shall displace the rule of those to whom the individual and his rights are sacred; whether we are to survive with God's hand to guide and lead us or to perish in the dead existence of a Godless world."

• • • •

Since General Matthew B. Ridgway delivered this Christmas message to his troops in Korea in 1950, events in Europe and the Far East have provided chapter and verse to illuminate his text. But because of stepped-up preparedness measures the ramparts of the free world still stand secure, and the humanitarian principles of charity, good-will and brotherhood still prevail in the world outside the Iron Stockade.

Two aspects of the Christmas season are depicted in this issue. The traditional Yule cover is the work of George H. Neumann of Visual Aids Section, Armed Forces Information School, while the center spread scene is by Corporal Irving Siegal of The Chaplain School, Fort Slocum, New York.

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U. S. Navy Photograph

REAR ADMIRAL CHARLES B. MOMSEN

KILLER SUBMARINES

REAR ADMIRAL CHARLES B. MOMSEN

WE ARE BUILDING better mousetraps. But, to continue with the adage, they are not so revolutionary that the world is suddenly beating a path to our door.

Our new anti-submarine submarines, or "killer" boats, were not built just to have them handy for some unforeseen requirement. They incorporate the most recent technical developments in a hull of improved design to accomplish a specific mission.

Necessity, resulting from the constant flow of scientific achievements which are advancing the art of naval warfare, caused the evolution of the K-class submarines. These boats were constructed, as are all new ship types, as the result of lessons learned in the past, changing needs and increased capabilities of those who might challenge our use of the seas.

The most publicized example of evolutionary—but not revolutionary—naval construction is the development of the so-called "super" aircraft carrier. "Super" is an inaccurate description, for the *Forrestal* is no more "super" today than the *Essex* class carrier was "super" when it was first designed. The *Forrestal* is the result of necessity. Our newer planes require longer runways, our jet aircraft require more fuel, and our carrier-based planes are capable of carrying a greater bomb load than ever before. Consequently, we desperately need large carriers that will meet the requirements. But such a carrier is no radical or extreme weapon. It is rather another step in the evolution of this type of vessel.

Similarly, the spectacular development of the helicopter illustrates the fulfillment of another real necessity in the Armed Forces. Its potentialities in naval warfare alone are enormous.

In the entire history of combat there has always been a series of measures and countermeasures. No device or weapon has ever appeared which has not resulted in some successful counter. This is particularly true of submarine warfare.

In the brief lifetime of the submarine (submersibles have

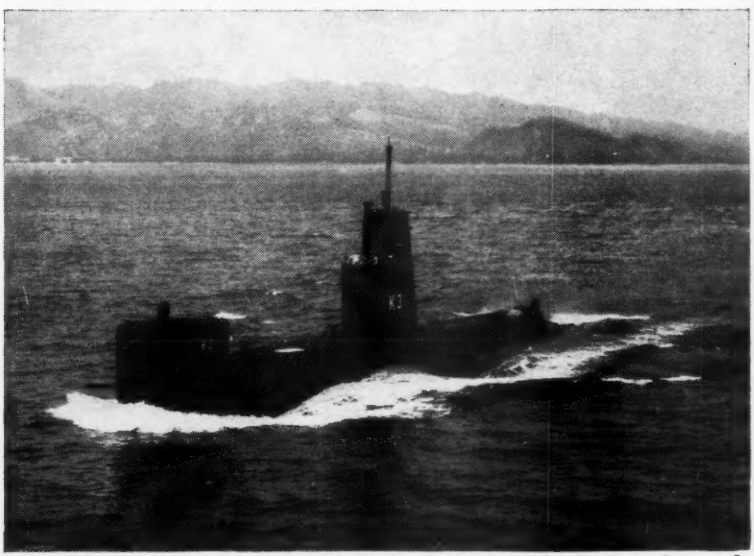
REAR ADMIRAL CHARLES B. MOMSEN, USN, is Commander, Submarine Force, U. S. Pacific Fleet.

been a part of our Navy for only fifty-two years) this type has had a striking success. Twice submarines have almost wrested control of the seas from a combination of countries whose predominance of sea power was otherwise hardly contested. To be sure, we defeated the German submarines in World Wars I and II. But the price we paid was staggering and only those few who were close to the inside realize what a tremendous hand luck played in these victories. Our ability to build ships faster than Nazi U-boats could sink them was mainly responsible, for a time, in overcoming this menace.

Our submarines met their first real test of battle in World War II against the mighty sea power of the Japanese in the Pacific. Our success was overwhelming and was of major significance in bringing the Japanese to their knees. With a strength of only one and a half percent of all naval personnel, the submarine force accounted for almost two thirds of the total tonnage of Japanese merchant marine losses—more than all other forces, surface and air, combined.

Confronted with these conflicting histories of the success and failure of submarine campaigns, what about the future?

Up to the present time the submarine has been an extremely elementary and restricted unit. It is a surface ship with the



The killer submarine is characterized by a short, stocky body and a snub-nosed bow crammed with sound detection devices. U. S. Navy Photograph

added capability of submerging for limited periods. The primary means of power has been dependent upon the atmosphere for combustion of fuels, and the small amount of power which can be stored in a battery severely limits the submarine's submerged speed and endurance. Scientists the world over are turning their attention to various types of engines which do not rely upon oxygen from the air for power. The atomic power plant for submarines is but one of several such developments.

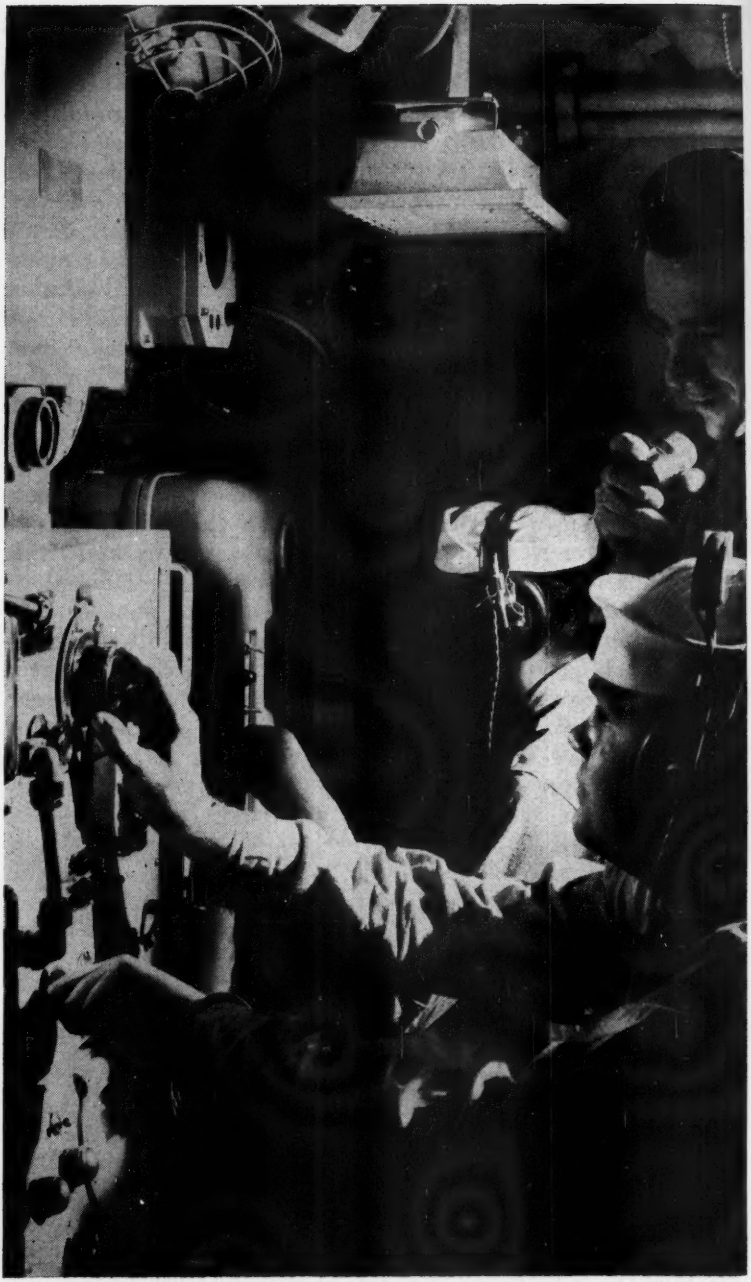
It is merely a matter of time until such power plants will be available and then a revolutionary change in submarine operations will appear. We shall then have a true submarine —one designed principally to travel submerged for long periods of time and occasionally come up to the surface.

In fact, the gagsters are already saying that the atomic-powered submarine (SSN) will be required to surface only once every four years, and then only for the purpose of reenlisting the crew. Such is hardly the case, but we know that this submarine will be far less dependent upon the atmosphere than anything we have ever built.

The greater power for submerged operations will unveil another capability of the submarine that has heretofore been denied it because of the need to conserve its limited power. A submarine completely submerged avoids to a great measure the loss of power caused by bow waves that is a hindrance to surface ships. It also avoids loss of power due to wind and sea. These factors permit a prediction that the future submarine, with characteristics specifically designed to take advantage of its underwater ability, will be capable of running submerged at speeds greater than those of any surface vessel.

It also becomes clear that the real threat of the submarine to surface ships lies ahead, and new countermeasures must be forthcoming. The use of the oceans of the world is free—free to those who are able to use them.

The submarine problem thus continues to be two-fold. Not only must we be prepared to use the tremendous striking power of the submarine by perfecting our weapons and our techniques for using them, but we must also be equally alert to the very real need for effective means of combating the submarine in the hands of an enemy. And, strangely enough, the execution of these two directly opposed missions has recently converged to a degree on the same shoulders. For a long time the submarine forces of the Navy have studied, practiced and used the offensive striking power of submarines. But the submariner's role in



In the sonar control room, Navy sound men use the latest electronic devices to detect the approach of "enemy" craft. U. S. Navy Photograph

anti-submarine warfare is relatively new. The evolution of the killer submarine (SSK) has been taking place for some time, but it is only in recent years that we have been able to visualize the part the killer will play in the underwater battles of the future.

The submarine problem is made difficult by the fact that the usual and valuable means of detection and communication common to surface ships—radar, radio and visual—are of little value in this struggle. The radiation of sound waves through water is the main source of intelligence. Sound waves are curious and complex. Their speed and direction are influenced by water density which varies because of temperature, salinity and depth. To complicate the problem further, sound waves through water are very much influenced by the frequencies at which they are generated.

The normal noises in the sea are called ambient noises. The approach of the enemy can only be heard reliably when the ambient noise is less than that emanating from the enemy vessel.

Self noise—that is, the noise made by the ship which is trying to hear—is the greatest deterrent to the detection of the submerged enemy. Since the wave-slap of the sea on surface ships and motion of the hulls through the water create a great deal of self noise, it becomes apparent that the most effective sound platform for extracting sound from the sea is by the submarine itself from below the surface.

The one weakness of the high-speed submerged true submarine of the future will be the noise it generates itself, and it is quite likely that the noise level will increase with the speed.

As I look into the future, I see the killer submarine as the ears of the fleet, lying in complete silence beneath the surface of the seas. The tactical use of the SSK will be ambush in nature. Hovering motionless and soundless in the dark depths, its keen ears straining to detect and track its victim, the killer will be able to attack and destroy any enemy submarine venturing into its web. It will also be able to warn other fleet units of an enemy it has heard, but at a distance too great for attack. Placed in critical spots or along barrier lines in such positions that they will not be required to move about, killers will have a decided advantage over enemy submarines which must move and make noise as they stalk in search of their prey.

New attack-type submarines may have all of the characteristics of the SSK and more. They will be able to perform all of the usual tasks expected of large submarines, including the destruc-

tion of enemy men-of-war. But these new submarines are very expensive. Each costs about twenty-five million dollars.

It is my hope that the SSK of the future, with its specific functions limited to stalking and attacking enemy submarines, will be small and simple. Its cost will then be less, and it should be capable of mass production through our highly efficient assembly line techniques. Without such a development we may not be able to afford the large numbers of submarines that we might need.

The evolution of warship designs is continuous. We know that the killer submarines we now have will not be the final answer to the problem, but they are the first vessels designed as anti-submarine submarines. We are learning much from our use of these three prototypes, the K-1, 2 and 3. We also have one conversion from a World War II fleet-type and have other conversions authorized. These killers are undergoing intensive evaluation to determine their weak and strong points. It is our intention to have the killer concept so fully exploited and tested that, should the occasion arise, we can go into production on short notice and obtain the best weapon with the most advanced equipment.

If the time comes when an enemy threatens our sea power with advanced types of submarines, I believe that our Navy will be ready with advanced countermeasures and that the submarine killer will play a prominent role.

ENGINEER TRAINING FOR KOREANS

CORPORAL THOMAS H. MAPP

THE AMERICAN CORPORAL walked over to the bulldozer. Clouds of chalk white smoke billowed from the machine, spiraling up into the chill of the Korean morning. "What's up?" the corporal asked the Korean Army sergeant at the controls.

"It's the fuel pumps," said the Korean. "I bled them just now."

Six weeks ago, Sergeant Kim Yang of the Republic of Korea (ROK) Army did not know a fuel pump from a camshaft. As for bleeding—he would have thought you were crazy.

Thousands of students at The Engineer School, Korean Army, (TESKA) at one time may have thought the Americans a little crazy. Like Sergeant Kim, they had come from small thatched hut villages which dot the length and breadth of the Republic, had been issued a uniform and a few weeks later were expected to know some of the mysteries of modern mechanized warfare.

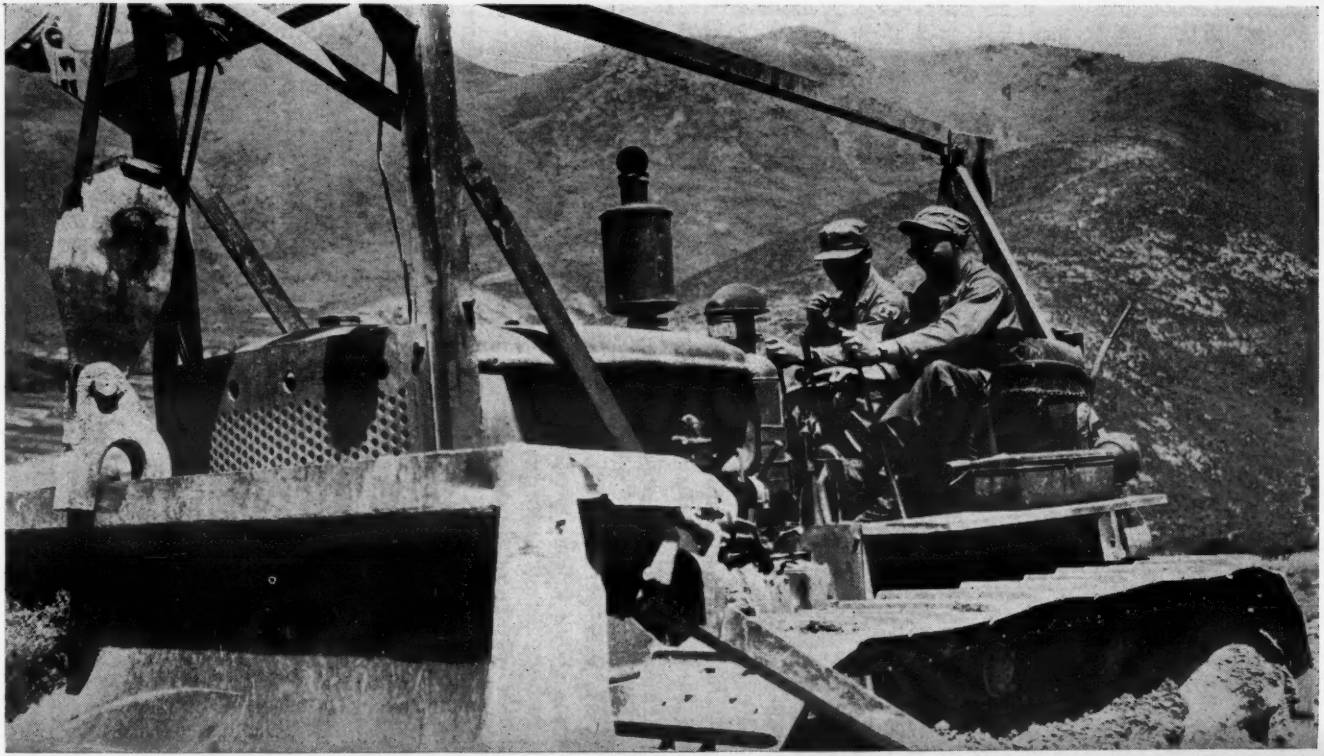
For thousands of Kims this transition was revolutionary and terrifying. It called for drastic readjustment to American methods and was in sharp contrast to the traditional Korean way of life.

Kim's life had been harnessed to the plow. His very existence was rooted in the rice paddies near his home. When a job was to be done in the fields it had meant back-breaking work with the aid of crude tools fashioned from sticks and a chunk of iron.

Today, on this rocky, chill-swept hill overlooking The Engineer School, Kim was operating a machine which could do the work of one hundred men and which would ordinarily take him years of saving to buy.

It was to teach Kim how to operate, utilize and maintain these machines that The Engineer School, Korean Army, was

CORPORAL THOMAS H. MAPP, USA, is on the Public Information staff of Eighth United States Army, Korea (EUSAK).



A Korean combat engineer learns to operate American equipment under the guidance of a KMAC adviser. U. S. Army Photograph

established. Proof of its early success can be found in the number of Korean Army engineers, both officers and enlisted, who are today engaged in every phase of combat engineering from mine laying to bridge building.

Nothing is spared to give these engineer recruits the very best training that can be provided. Equipment is American and the training program is similar to that conducted at The Engineer Center, Fort Belvoir, Virginia, where the United States trains its Army engineers.

The school operates under the supervision of Brigadier General Cornelius E. Ryan, USA, Chief of the United States Korean Military Advisory Group (KMAG). Administration is conducted by ROK Army officers, who are advised at all levels of operation by six officers and seven enlisted men of KMAG. The instructors are Korean officers, all graduates of the school who periodically take post-graduate and refresher courses there.

The curriculum offers four engineer officer courses, fifteen enlisted specialist courses and one basic army engineering course. Subjects range from welding, carpentry, rigging, water supply and tool-room organization to surveying and bridge building. Each course is highly specialized, although some margin is allowed to familiarize each student with the machinery and equipment he may be required to operate in an emergency. This overlap also allows the student to know something of the other man's job, an important factor where close teamwork is essential.

Classes usually consist of from ten to twenty men, but the small number is not surprising considering the complexity of many of the subjects taught. For example, few unskilled Americans, let alone Koreans, could master the fundamentals of a heavy-duty air compressor in half an hour. With a small class working as a unit, the instructor is able to take the time to explain the mechanism step by step until the subject is firmly grasped.

The language barrier is possibly the greatest difficulty that KMAG personnel have had to overcome. Textbooks, training aids and other written materials must first be translated into Korean from standard American engineering manuals. This has become a major operation, calling for a large group of interpreters and translators, working sometimes into the early hours in preparation for the next day's lectures. Such translations have formed a basis for all current instruction, but as there are no printing presses or Korean typewriters available, the

A Korean combat engineer learns to operate American equipment under the guidance of a KMAG adviser. U. S. Army Photograph

task of hand etching and reproducing each page is arduous.

Because of TESKA's influence, American technical terms are rapidly finding their way into the Korean tongue. A cotter pin is a cotter pin in both languages; a piston is a piston, and so on. The Koreans have no equivalent translations for these terms and it is not unusual for a visitor to the School to hear bursts of American "technicalese" being fired back and forth across a classroom of non-English speaking Koreans. Introducing these terms into the Korean language has proved to be a boon for Americans, who experience difficulty enough with the language. Where formerly a headlamp might be described by a Korean soldier as "a shiny rice bowl with a candle in the center," now it is a headlamp, thanks to the standardization program.

A lieutenant colonel of the United States Army Engineer Corps is KMAG Senior Adviser at the School while the commandant is a Korean lieutenant colonel. Both are graduates of The Engineer School at Fort Belvoir and work jointly on all problems of administration and operation.

The ROK Engineer School is operating almost at peak capacity with some seventeen hundred students now attending courses there. The estimated yearly student potential is over thirteen thousand men, considered sufficient to meet the immediate and possible future needs of the Korean Army.

Men are billeted in tents or dormitories. In a vast open air kitchen, barrels of rice are cooked daily along with fish and a little meat, sufficient to feed the entire student body at one sitting. The average student puts in a long and tiring day and there is little time for relaxation, but volleyball courts have been built and there is space and a little time for football, Korean style.

The student divides the majority of his time between the classroom and the sprawling one and a half square miles of hilly terrain that make up the training area. The site looks more like a huge Stateside construction job. Powerful bulldozers move through mounds of earth and clay, while towering crane shovels scoop up the dirt and swing the load onto waiting trucks. Seated at the controls is a young Korean soldier who operates the mechanical shovel with the ease and confidence that comes with effective teaching and experience. A Korean officer is at his side, while below on the road the remainder of the class watches silently and with an air of expectancy as the machine grinds to its work. Soon it will be their turn at the controls.

Down to the right, on the next ridge, a second class of about a hundred men is at work on construction of a Bailey bridge, a job that calls for maximum teamwork. The men work on the sections, bolting them to the framework as the nose is steadily pushed out across the cut.

To the left, a third class is at work rigging a rope and trestle bridge. Here the Koreans are especially adept. Most of the scaffolding is rope lashed and there is little that they do not already know in the way of knots, shearing, splicing and block and tackle work.

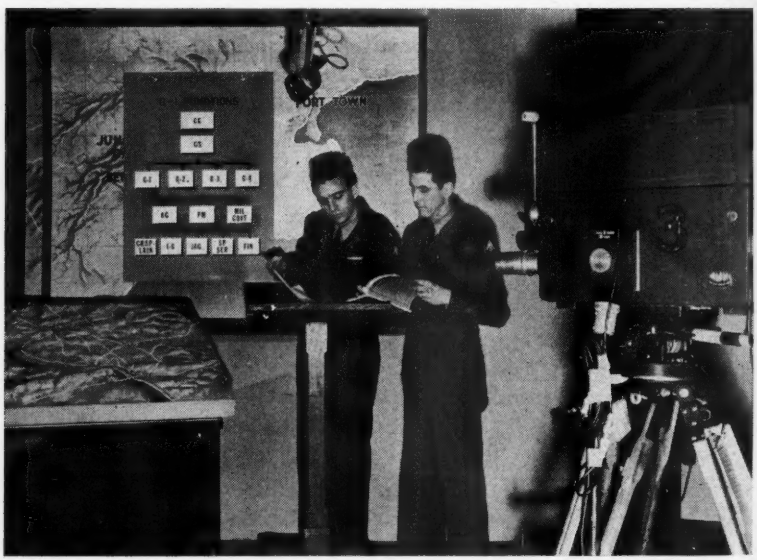
Across the draw, a demolition team is drilling hard rock, preparatory to placing charges. After the blast, the debris is cleared away and the road construction crew moves in with bulldozers and shovels.

With each new class, the training areas are steadily being improved. Roads built by the students as part of their practical work wind through the area, while experimental buildings erected by former classes add to the School's facilities.

Although the School has produced thousands of trained engineers and is a contributing factor in the revitalization of the Republic of Korea Army, its history has been brief. In 1946 a small component engineer school was opened at Kimpo where a handful of KMAG experts trained Korean engineer officers and conducted four enlisted specialist courses. With the start of the present conflict the School was closed temporarily, then reopened as part of the Ground General School, Korean Army, in September 1950. The following February it was moved to its present location and designated as The Engineer School, Korean Army.

Here, in the classrooms and training areas of The Engineer School, KMAG officers are helping to create an efficient fighting force from the untrained manpower of the Republic of Korea. If determined application of principle is any indication of future progress, the sight of bulldozers and crane shovels manned by Engineer School graduates and engaged in road building throughout Korea is convincing proof that the Korean people are taking their lessons to heart.

A television program at the Special Devices Center is shown as it appears from the studio control booth. U. S. Navy Photograph



Microphone boom and television camera move in for a close-up scene in the "Command Post" program for Reservists. U. S. Army Photograph

TRAINING BY TELEVISION

MAJOR CLAUDE H. STEWART

TRAINING the Armed Forces in the future will take less time and fewer instructors—thanks to television. It is entirely possible that a division in the near future may move into a special training area where large television screens are installed. In company squad rooms, officers and men will see and hear instruction broadcast via a closed television circuit from studios in the office of the division G3. There the best instructor brains in the division, using the best training aids obtainable, will be conducting lectures and demonstrations before television cameras.

Back in the squad rooms, officers and men will learn the lecture and demonstration data together. During the application and examination phases, the officers and noncommissioned officers will act as assistant instructors. Finally, during the critique phases, microphones in the squad rooms will be used to call in questions to the instructor in the studio.

New methods of training by television now under study or already in use will make today's methods seem as slow and archaic as the horse and buggy age. Anticipating the day when telecast instruction will reach thousands with the flick of a switch, the Department of the Army in 1949 requested that a study be made to determine whether Reservists could be effectively trained by television. The Navy Special Devices Center on Long Island, and Fordham University in New York City carried out a joint experiment to answer this and other related questions about telecast instruction.

The Special Devices Center telecast eight one-hour lessons at weekly intervals to more than three thousand Army Field Forces Reservists in ten New England and Midwest cities over a network of commercial stations. Material prepared by the Psychology Department of Fordham University was used to test the Reservists on what they had learned. The scores were analyzed and conclusions were drawn from the tests and from

MAJOR CLAUDE H. STEWART, Transportation Corps, is Army Television Project Co-ordinator, Special Devices Center, Sands Point, Long Island.

comments made by the Reservists and training specialists.

The series, called "Command Post," showed in successive installments how a typical infantry division helped to repel a hypothetical invasion. Each of the lessons explained a different phase of the division's operations. The basic outline was prepared by the faculty of the Command and General Staff College at Fort Leavenworth, Kansas; and the Army Signal Corps Photographic Center at Long Island City, New York, developed the scripts and produced the programs. The Reservists, both officers and enlisted men, formed in small groups of about twenty each to watch the programs.

The lessons revealed Aggressor launching a surprise airborne and amphibious attack on the fictitious city of Port Town, U.S.A., seizing it and then sweeping on to the south. The programs showed the United States division's advance to close with the Aggressor, the planning and carrying out of the attack by the division, and the successful conclusion of the operation. Various phases of the division's action were taken up in individual programs with emphasis on the need for planning and teamwork throughout. Professional actors presented the narrative portions and played the roles of the division commander and his staff. General officers of the Army introduced and concluded each hour's program, describing the roles of the various branches and pointing up the importance and benefits of Reserve activities. Tests were given before each program to find out what the Reservists already knew about the subject; at the close of each session, follow-up examinations were given to find what they had learned. Days or weeks later, further tests were given to find out how long they retained the information.

Evaluations showed that television is an effective method of mass instruction. Officers and enlisted men, from colonel to private, made higher scores on the after-lesson tests than they did on the pre-lesson tests. Naturally the scores varied considerably because of the different backgrounds of the individuals, but they showed, for example, that while only 16 percent achieved a given high score on the pre-lesson test, the majority of the Reservists made a high score on the after-lesson test. Also, when the test results were further analyzed according to grade and type of service, all groups had made significantly better scores after each lesson.

The retention tests indicated that telecast instruction stayed with the individuals. This is extremely important, since no

matter how high the test scores are immediately after each lesson, this new method of teaching can not be called truly effective unless the lesson material is retained. In retention tests given one to six weeks later, both officers and enlisted men achieved high scores.

The "Command Post" series rated high with Reservists. Nine out of ten considered the training method good or excellent, and nearly three-fourths of them said they would rather be taught by television than by the usual classroom methods. Other carefully conducted experiments continue to substantiate the conviction that telecast instruction is as good as or better than classroom instruction.

Army Signal Corps cameramen prepare to shoot a scene for use in the "Command Post" telecast. U. S. Army Photograph

Reservists enrolled at nine different Naval Air Stations took two series of eight telecast lessons—one series a refresher course for officer pilots, the other a basic training course for enlisted personnel. Experienced Navy training officers selected the topics and prepared lesson plans of the type regularly used by Reserve instructors. These lesson plans were then turned over to three independent groups. The Special Devices Center used them to produce a series of telecasts. Local instructors used them to prepare their regular classroom lectures. And the television evaluation specialists of Fordham University used them to de-

velop tests which would measure the results of the experiment.

One group of Reservists watched the live television programs while a second group received conventional classroom instruction with appropriate training aids. The group receiving the telecast instruction sat in a classroom, ten students to each sixteen-inch television receiver. A talk-back microphone in each classroom allowed the students to ask questions of the television instructor. As in other experiments, tests were given to each group to find out what the students knew before the lessons and what they had learned afterward.

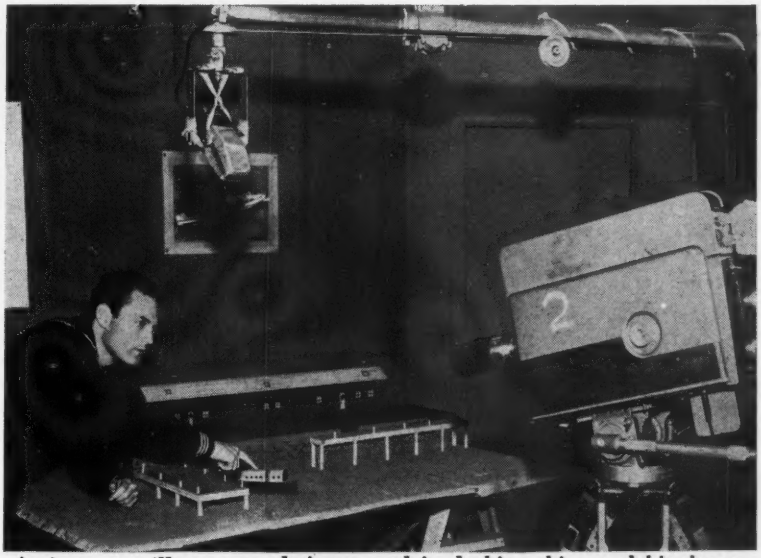
For the officers, telecast instruction was more effective in 50 percent of the comparisons and in another 38 percent it was just as effective. For the enlisted men, television was more effective in 53 percent of the cases and just as effective in another 20 percent. In 80 percent of all the comparisons, television was as good as or better than conventional instruction.

Television instruction, even in the form of kinescopes—*i.e.*, film made of television programs—has tremendous prestige with students. Kinescopes were tested against standard Armed Forces training films and were discovered to be comparably effective, despite the fact that kinescopes have the obvious limitations of not being as sharply delineated on the screen as training films and, moreover, are lacking in the professional "slickness" which characterizes many standard films. Kinescopes were found to be about equal to live television for training purposes.

Not all television education is top-notch simply because it is on television, however. The experiments have already shown that certain techniques in telecast training are better than others. In the "Command Post" series, narration by the instructor alone or narration combined with some other form of teaching was extremely effective. On the other hand, drama without narrative to point it up did not produce nearly as much gain in test scores. The largest accretion of learning occurred when the television picture amplified or illustrated the meaning of the narration. Based on percentage gain in correct answers to test questions, the five teaching techniques on television were rated as follows: Narration alone, 21.8; narration plus atmospheric film (which only set the scene but did not give any actual facts to the viewer), 14; narration plus meaningful film, 34.2; narration combined with drama, 28.5; and drama alone, 11.5.

A salient advantage offered by televised instruction is the saving in instructors. The Chaplain School at Fort Slocum,

New York, is already benefiting from this technique. After an increase of students at the School, it was found that instructors were kept so busy repeating their lectures to new groups they had litle time for research to bring their material up to date. Today, however, televised lectures are channeled on a closed circuit to groups in different classrooms simultaneously, permitting a saving of time and effort. While an auditorium might accommodate the same large number of students at one time, most educators agree that small groups are better than large audiences for teaching. The television camera also has the ability to move in for close-ups of the instructor and his training aids.



An instructor illustrates techniques used in docking ships, and his demonstration is televised to class groups. U. S. Navy Photograph

Kinescopes promise to save many more instructor hours by providing permanent recordings of lectures for future classes long after the instructor has moved to other fields. The Chaplain School is experimenting with kinescopes for this purpose.

The Chaplain School set up its first studio in 1948 to train Army and Air Force chaplains in the fundamentals of television production so that they would be better prepared to meet television engagements in their local communities. Later it found television equipment useful in developing public speaking abilities. Fundamentals were learned faster when students

could watch themselves in action on a monitor screen. Kinescopes are also used as permanent records to be studied until the student has eliminated undesirable speaking mannerisms.

So far there does not seem to be any serious limitation on the type of subjects which can be successfully taught by television. While the Chaplain School has tried only liberal arts subjects, the Signal Corps School at Fort Monmouth, New Jersey, is using television to teach technical subjects to its enlisted students. Experience there shows that televised instruction in technical subjects is as good as or better than classroom instruction. Meanwhile, the Army Participation Group at the Special Devices Center in co-operation with Iowa State College is presently running experiments to find out what subjects are best suited to television.

Other problems, too, will have to be studied before television can be exploited for rapid mass learning. Television writers and directors who are specialists in educational television must be found and developed. They must understand how educational television differs from commercial entertainment, and recognize that it is more important for a lesson to be clear and direct in meaning than for it to be merely a "good show."

Educational experts are needed who can plan television lessons based on sound psychological principles. These specialists must help the writers and directors make the fullest use of television for training. A rapid method of evaluating the effect of television training is needed, too. Those responsible for training programs must know whether the programs are accomplishing their objectives so that any necessary changes can be made promptly.

Increasingly the practicability of television instruction is gaining widespread recognition throughout the services, primarily because it saves time and manpower—two elements which are critical in a period of general mobilization. All those connected with training programs for the Armed Forces must be encouraged to become familiar with the techniques of this latest medium whose potentialities as an instrument of rapid mass learning are only beginning to be realized.

NEW HORIZONS IN PSYCHOLOGICAL WARFARE

LIEUTENANT ERNEST CONINE

"IN FIFTY YEARS' time, there will be no great reason for the existence of armies. We shall have undermined our enemies sufficiently before hostilities begin, so that the military organization they possess will be incapable of being used in the hour of need."

Nicolai Lenin made this amazing prediction of the coming power of the Kremlin's methods during the early years of Red rule in the Soviet Union. This "way of doing business" has evolved into the system of infiltration, subversion and political and propaganda warfare which now characterizes the international Communist conspiracy popularly referred to as the "cold war." Not the least important of these factors is the Kremlin's vast effort in the field of propaganda.

Lenin's prediction has not yet materialized—but neither has his "fifty years' time" elapsed. However, the Red leader's words and the Kremlin's gigantic effort in the field of propaganda do shed light on the great importance which the Soviets attach to psychological warfare as a means of achieving their objectives.

This Communist emphasis on the power of ideas has caused all armies to focus attention on the political and psychological factors of modern warfare. And it has accelerated the American development of psychological warfare—a weapon which American troops first employed in the Revolutionary War.

During periods of peace or cold war, the State Department through its Voice of America and kindred information services is responsible for presenting the American viewpoint to the world. But in Korea—or any other combat area—psychological warfare is the soldier's business.

Psywar, as it is usually called, has often suffered from two extremes of misunderstanding. On the one hand, overzealous

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champions have regarded it as a miracle weapon which can win a battle with a few well-chosen words. At the opposite pole, its detractors have considered psychological warfare a useless shower of confetti brought to the battlefield by impractical dreamers in uniform. Both viewpoints are wrong.

Military psychological warfare is a support weapon. Its mission is to *help* the combat arms win battles. It does this by employment of propaganda and related measures to affect the minds, emotions and behavior of enemy or friendly foreign groups within a theater of war.

Psychological warfare is, in effect, merely the application of the principles of mass persuasion to the science of war. It is employed to persuade the enemy soldier or civilian to take actions which will hurt his leader's cause and help ours.

The psychological warfare soldier uses ideas as "bullets" which are delivered to the target audience in the form of radio and loudspeaker broadcasts, leaflets and other printed materials. Primarily, these are aimed at tearing down the enemy will to resist. The target may be a civilian group in the enemy homeland, the enemy infantryman just across the lines or civilians in the combat zone.

Psywar has played an important role in the Korean fighting. Loudspeaker teams are in demand by front-line units. Leaflet drops or loudspeaker broadcasts are co-ordinated with major operations of the combat arms. Official reports reveal that Psywar not only has played a part in the surrender of large numbers of Communist troops to United Nations forces, but also has placed a strain on the Red security system. Communist Party members must constantly watch other members of their units. Special troops are employed in an effort to snare Red soldiers attempting to surrender or desert to the rear. These measures create a constant air of tension which makes the Communist army still more susceptible to propaganda.

When the North Korean Communists poured across the 38th Parallel in June 1950, a small detachment at Fort Riley, Kansas, constituted the entire psychological warfare troop strength of the Army. A rapid expansion of this neglected weapon was quickly ordered. Meanwhile the Psychological Warfare Division in the G3 section of Department of the Army evolved into the present Office of the Chief of Psychological Warfare, a special staff agency with direct access to the Chief of Staff.

Psychological warfare units had to be quickly organized and trained despite an acute shortage of qualified personnel. Only

a few veterans of World War II propaganda battles against the Germans and Japanese were available. These Psywar veterans in turn depended heavily upon newcomers—men who had the proper background but no actual experience at the job. An ambitious training program was organized under the Chief of Army Field Forces to weld specialists from various fields into effective psychological warfare teams.

A psychological warfare course was set up at Fort Riley in November 1950 and the following May the first Psywar School in Army history opened its doors as a division of the Army General School. Within a year, the School had graduated some two hundred and fifty officers and one hundred enlisted men ranging in grade from private to colonel. Graduates, in addition to Army personnel, included representatives from the Navy, Marine Corps, Air Force and six member countries of the North Atlantic Treaty Organization.

The Psywar training program took another step forward in May 1952 when the Psychological Warfare Center was activated at Fort Bragg, North Carolina, to take over and expand the training activities formerly carried on at Fort Riley. The Center has the mission of conducting individual training and supervising unit training, developing doctrine and techniques, and testing and evaluating new equipment.

The success of any training program depends heavily upon the quality of the men who are trained; Psywar specialists are therefore carefully selected. Mountains of records are combed to uncover men who can perform Psywar duties. Applications for assignment to Psywar, submitted through regular channels, are carefully screened on the basis of past education and experience.

Personnel for technical jobs such as photolithography, press maintenance, radio installation and repair are obtained primarily from the ranks of experienced technicians entering the Army from civilian life, and from Army technical schools and services. These technical specialists normally are not trained in propaganda techniques.

Selection of Psywar personnel who actually plan and create propaganda, poses a more difficult problem. Obviously a good psychological warfare man combines many talents. He must be a good soldier, with a soldier's understanding of how the enemy will react to given combat situations. His background and training also must enable him to understand and interpret complex international issues—but without losing touch with

the hopes, fears and hatreds of the common enemy soldier or civilian. In addition, he must have the competence to translate his knowledge into effective radio and loudspeaker scripts, leaflets and other printed materials.

Certain criteria have been established for officers and enlisted men in the creative and planning phases of Psywar. They should be college graduates or possess equivalent training or experience in journalism, radio, advertising, art, public relations, international relations or related fields. Past residence in a foreign country and fluency in one or more foreign languages also are desirable qualifications.

Officers should have credit for a basic branch course, and enlisted men are accepted only after completion of basic training. Combat-experienced personnel are preferred for tactical operations where Psywar men work with combat infantrymen.

Once over the screening hurdle, the next step is the Psychological Warfare School, a part of the Psychological Warfare Center. Here the student receives intensive individual schooling in the background, organization, media and methods of modern military propaganda.

The officers' course is of twelve weeks' duration, while enlisted students receive their diplomas after six weeks. The program of instruction includes such subjects as Propaganda Methods and Techniques, Semantics and Propaganda, Radio Script-writing, Intelligence for Psywar, Psychology of Surrender, Communist Theory, Foreign Army Organization and seminar-type projects covering specific areas of the world. Army staff relationships also are emphasized in the officers' course, because Psywar officers must work closely with almost every staff section.

The course is climaxed by a practical command post exercise in which groups of students are given a Psywar "mission" to accomplish in a potential enemy target area. They are provided intelligence concerning the area and nature of the people—especially information which throws light upon important differences of opinion in the target area, cleavages which may be exploited by skillful propaganda.

Thus, if the target country is composed of racial, religious or national groups which are constantly at each other's throats, propaganda can intensify their animosity and attempt to channel it in directions favorable to our cause. In Communist countries, for example, the propagandist would be interested in increasing ill-feeling between farmers and city dwellers,

the party elite and the common workman, the army political officer and the commander whose power he often usurps. All are grist for the strategic, or long-range, propaganda mill.

Among vulnerabilities which may be exploited in the combat zone, the Psywar man looks for failure in the enemy supply system, bitterness between officers and enlisted men, lack of adequate weapons, poor leadership and anything else which can be used to make the enemy soldier so dissatisfied that he becomes a less effective fighting man.

After deciding which enemy vulnerabilities offer the best propaganda possibilities, each group of students composes a leaflet or radio script which could be used to pierce the potential enemy's psychological armor. Students are encouraged to present their own ideas for evaluation. In this way, each student receives the benefit of the specialized knowledge and experience of his colleagues. In a discussion period faculty members also offer constructive criticism.

The course packs some surprises. Students learn that the United States avoids untruth in its propaganda output for a very hard-headed reason. There is no shortage of damaging truths to employ against a totalitarian enemy. But once the propagandist is caught in one falsehood, the target audience loses confidence in everything he may say in the future.

Another surprise—the student finds that enemy surrenders, although the most tangible evidence of tactical effectiveness, are not the primary goal of the Psywar weapon. "Disaffection is like a contagious disease," explains a Psywar School faculty member recently returned from Korea. "A disgruntled enemy soldier may do us more good by staying put and depressing morale in his own camp than by coming over to our side. In that way, the entire unit's fighting effectiveness is lowered."

The Radio Broadcasting and Leaflet (RB&L) Group and the Loudspeaker and Leaflet (L&L) Company are the basic units responsible for conducting Army psychological operations. In these units, officers plan and supervise operations, while most of the actual writing and production of propaganda materials is done by enlisted specialists.

The RB&L Group spreads strategic propaganda, which is the "Long Tom" of Psywar, and it supports the field army in conduct of tactical propaganda. Planning for strategic operations is done by a Psywar staff at theater headquarters.

These plans are translated into propaganda themes by Headquarters and Headquarters Company of the RB&L Group.

Propaganda officers and their enlisted writers and artists prepare radio scripts, leaflets and other printed materials carefully calculated to achieve the proper psychological effect.

Announcer-linguists and other program production personnel in Headquarters and Headquarters Company take the radio scripts and turn out finished programs—normally on tape recordings. These recordings are then transmitted to the Mobile Radio Broadcasting (MRB) Company, where they are rebroadcast to the target audience at the proper time. The MRB Company consist of three platoons, each of which is equipped with a mobile, five-kilowatt radio broadcasting station.

The Reproduction Company of the RB&L Group is responsible for actually printing and processing leaflets and other printed materials composed in Headquarters and Headquarters Company. It is equipped with four photolithographic printing presses capable of turning out many thousands of leaflets per hour. These leaflets are loaded into bombs and dropped on enemy targets by the Air Force.

The L&L Company conducts combat propaganda under supervision of Psywar staff officers at army and corps levels. One such company is assigned to each field army.

The chief tools of the tactical propagandist are leaflets, fired by artillery and dropped by tactical or liaison aircraft, and loudspeakers mounted on jeeps, tanks or aircraft. Hand-carried instruments and loudspeakers mounted on tanks and aircraft also are employed in Korea.

Military psychological warfare is a combat job, as an examination of casualty reports will show. When a soldier shoves a loudspeaker into place and begins broadcasting to an enemy less than a thousand yards away, he is a combat man, as evidenced by after-action reports such as these: ". . . in ground loudspeaker operations, Team One received 181 rounds of enemy artillery and mortar during a 24-hour period . . ." "Two aircraft were hit by enemy ground fire while on leaflet missions. . . . One was hit by a 40mm shell while flying at six thousand feet. . . . A Psywar crew member was hit by shell fragments and died almost instantly."

In the zone of interior, participation in maneuvers and field exercises lends reality to unit training. Psywar unit personnel learn to work in close co-ordination with the combat arms. Members of the combat arms in turn gain a better appreciation of the capabilities and limitations of the psychological weapon.

Selected Psywar officers undergo advanced training to round

out their backgrounds and qualify them for high-level staff positions. Much of this training is accomplished at civil educational institutions where officers receive two years of graduate-level civil schooling in international relations, with emphasis on history, ideology and propaganda. A more concentrated course of sixteen weeks, offered initially at Georgetown University, deals with the subtle aspects of propaganda and with religious, political and economic factors in critical areas.

Some officers are sent through a four-year Area Specialist Training Program. This includes one year in a university followed by one year of language training and a two-year oversea assignment in the geographical area of specialty.

Other officers may be assigned to the State Department for six months to gain familiarity with that agency's oversea information program, including the Voice of America. After spending two weeks at the department's Foreign Service Institute, they undergo on-the-job training in various phases of State Department operations.

Other Psywar officers attend the Army Language School at Monterey, California, for intensive training in critical languages. Selected enlisted personnel also participate in this advanced language program. (See "Army Accent on Languages," August 1952 DIGEST.)

Psywar as a military weapon is receiving increased attention in service schools. All officer branch schools offer indoctrination hours on Psywar, and the subject occupies an important place in the curricula of the Command and General Staff College, Army War College, Armed Forces Staff College, National War College and Reserve Officers' Training Corps.

As techniques of mass persuasion are refined, Psywar becomes increasingly important within the military establishment. The demand for trained personnel is constantly expanding, particularly for reservists and inductees who come from such related fields as radio, journalism, public relations or teaching. As a new and growing career field, Psywar presents a challenge to the conscientious soldier. Promotion opportunities are comparable to those found in other assignments and the chances for pioneer work and achievement are unlimited. For the enterprising and the imaginative, a career in Psywar holds forth the reward of self-satisfaction in a vital job well done.

INTERNATIONAL AMITY IS THIS CLUB'S AIM

A GROUP of American soldiers stationed in Karlsruhe, Germany, is getting a first-hand education in international understanding for the bargain price of twelve cents a month in dues.

They are among the two hundred persons, representing fifteen different nationalities, who hold membership in the Karlsruhe International Club, an organization whose members pay dues in German marks, tour French cities, speak English at meetings and hold periodic discussion panels on subjects of world interest. Countries represented on the Club's rolls include Bulgaria, Canada, Egypt, France, Germany, Great Britain, India, Iran, Luxembourg, Mexico, the Netherlands, Norway, Switzerland, Turkey and the United States.

This unique international club—only one of its type in the European Command—was born in the spring of 1951 when foreign students attending the Karlsruhe State Technical College, members and dependents of the military and diplomatic corps of the occupying nations and cultural-minded Germans decided to organize a group to promote mutual understanding. The first meeting was held at the home of the United States HICOG Resident Officer in Karlsruhe, about forty miles southwest of historic Heidelberg. The idea was an immediate success. Soon many local residents and foreign visitors were attending discussions, musicales, excursions and informal gatherings.

To insure active participation by American soldiers and dependents, English was made the official language of the club. A number of German members who had visited the United States under auspices of the State Department Cultural Exchange Program also found this arrangement helpful in enabling them to perfect their knowledge of English.

The first president of the International Club was the director of the French Cultural Mission in Karlsruhe. An American serving as chief consultant with the European Command Historical Division was elected vice president, an English woman

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This article was prepared by members of the Public Information staff of Heidelberg Military Post, European Command.

was chosen as treasurer, and a German girl acted as secretary. The current president is a twenty-three year old German youth, a student at Karlsruhe College.

Initially the membership consisted predominantly of older people past the half-century mark but today they are in the minority. The increase in youthful participation has been accompanied by a stepping up of activities and a broadening in the scope of projects undertaken by the Club.

Several cultural, educational and recreational groups have been formed to meet the demand for diversified activities. Representative of this movement is the square dance group that has become proficient enough to perform for other clubs in the area.

The organization also sponsors a chorus composed of Boy and Girl Scouts. Known as the Joyous Heart Choir, this choral group has appeared before many international audiences singing American, English and German selections. Recently the chorus completed a tour of France where they presented recitals in many of the larger churches.

One of the outstanding accomplishments of the Club was the launching of Operation Tannenbaum (Christmas Tree)—a Yuletide goodwill project for the promotion of American-German understanding. The Club sponsored an advertisement in a local paper urging Germans to invite American soldiers to visit their homes during the holiday season. The response was overwhelming; more than two hundred soldiers were invited to German homes for a "Christmas away from home."

After the holidays a flood of letters from pleased German families poured in to the Club. They praised the soldier visitors and urged that more such activities be organized. The soldier guests also expressed their deep appreciation.

An example of the enthusiasm which the program aroused is reflected in the following portion of a letter from a German woman: "For me and my children it was an unforgettable sight watching the eyes of this young boy gleam as he lit the candles on the tree. . . . We have invited our soldier again to spend the New Year's Day with us."

Another innovation, Operation Osterhase (Easter Bunny), was just as successful as its predecessor. Many of the same soldiers were invited into German homes at Easter time, along with sixty American and French soldiers newly assigned in the Karlsruhe area. In this instance, soldiers and families alike were screened to make certain that there was some

basis of mutual interest such as age, knowledge of language, hobbies or cultural pursuits.

A month-long international summer youth camp in the heavily forested region of Central Germany is also sponsored by the Club. Trained youth leaders from France, Germany, Norway and the United States work at the camp where recreational facilities include horseback riding, hiking, tennis, swimming and handicrafts. Since the camp is operated by volunteer workers, fees can be kept low enough to permit children of poor families to participate.

Discussion panels instituted by the Club appear before civic and service organizations in the vicinity. The first panel was composed of six Karlsruhe citizens who had just returned from a tour of the United States and a representative group of soldiers chosen for their knowledge of Germany. The German members answered questions about German history, economics, youth affairs, commerce, industry and culture. Audience enthusiasm and the size of the gathering, running well into the hundreds, demonstrated the success of the venture.

A similar program—the International Youth Forum—has also been launched by the Club. Here young people of all nationalities meet to discuss problems of government and of international relations. A recent and typical forum group consisted of American, Canadian, Dutch, English, French and Indian youths.

In its first year of activity, the Karlsruhe International Club is surpassing all expectations in developing mutual understanding among young people of differing nationalities. Membership is growing, the scope of activities is increasing and finally, as the greatest tribute, civic leaders from other German cities are visiting the Club meetings with an eye to establishing similar organizations in their own areas.

CHRISTMAS 1952

"The light is shining in the darkness and the darkness has not overwhelmed it."

John 1:5

Drawing by Corporal Irving Siegal, USA
The Chaplain School

SOLDIER AMBASSADORS

JUDSON GOODING

TAKE an American boy in his late teens or early twenties. Put him in uniform and give him four months of training. Send him to Europe and station him in Wetzlar, Germany, La Rochelle, France, or any other place where United States personnel are located.

Perhaps even to a greater extent than our professional diplomatic corps, this is the man who shapes European opinion of the United States. In his daily contacts with farmers and townspeople, in his performance of his military job, in his appearance and conduct, he represents the United States to the average European. The people of these countries see him as a typical American, reflecting all the virtues and shortcomings of their ally across the sea.

True, his job is primarily military and he must excel as a fighting man. But he has another important responsibility—as an ambassador of democracy. And while he is not expected to follow the protocol of formal diplomacy, he nevertheless must have a basic knowledge of European culture, traditions, customs and history, and of United States policy abroad, if he is to fulfill his mission successfully.

Fortunately, a well-established program now exists to instill this essential background knowledge in the average serviceman who finds himself suddenly uprooted from his home environment and placed on orders for oversea duty.

The European-bound soldier going through Camp Kilmer, New Jersey, is given four hours of orientation. Through the use of serious talks, cleverly presented skits and quiz programs, he is informed in an interesting and effective manner; he learns why he is going to Europe, the part he will play in Western defense, the need for conducting himself in Europe as he would in Hometown, USA. This is followed by a panel discussion in which "Operation Briefer" teams, recently arrived from Europe,

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answer the many questions the soldier has concerning his new assignment and his new location. Each team usually consists of an Information and Education officer and an enlisted man. After leaving Camp Kilmer their principal job is to conduct briefings aboard troop transports. Using the loudspeaker system, ship's newspaper and illustrated lecture, they reach every person, dependents as well as servicemen, en route.

At replacement depots in the European Command, those who will serve in Germany are given a six-hour orientation series which includes briefings on such topics as: "Why You Are Here," "You and the German People," "The Atlantic Pact," "German Leaders," "Birth of a Republic," which deals with the government of West Germany, and "Safety." Men going to France attend most of these sessions but receive added briefings from materials supplied by the Office of Armed Forces Information and Education.

While in Europe the soldier learns of the people and country through *The Stars and Stripes*, unofficial newspaper of the overseas command, unit newspapers and the facilities of the American Forces Network. *The Stars and Stripes* and unit newspapers frequently publish background articles on our mission in Europe and how it is being accomplished. A recent series in

Members of a Briefing Team answer queries of Camp Kilmer soldiers concerning duty in Europe. U. S. Army Photograph

The Stars and Stripes helped clear up misconceptions on occupation costs, the derequisitioning of housing and related topics of local interest.

The soldier is further reminded of his duties as a military man and as a representative of the United States by a weekly unit Command Conference. Topics for troop discussion are drawn from *Armed Forces Talks, Troop Topics* and the *EUCOM Information Bulletin.* The Bulletin is a periodical designed to keep EUCOM servicemen informed on topics of comparatively local interest, such as "Geography of Germany," "Highlights of German Culture," "The British Soldier" and the like.

Many opportunities are offered to servicemen and their dependents to learn the language of the country where they are stationed. At Army and Air Force Information and Education Centers throughout the European Command, off-duty instruction in languages is given at no expense to the serviceman. Competent instructors, usually native born, are available to teach. In a relatively short time, the serviceman develops a working knowledge of the language and thus finds his way open for a clearer understanding of foreign peoples and their problems.

In addition to these off-duty classes, *The Stars and Stripes* offers a daily German lesson and the American Forces Network

A humorous skit helps dramatize problems of international relations for European-bound troops. U. S. Army Photograph

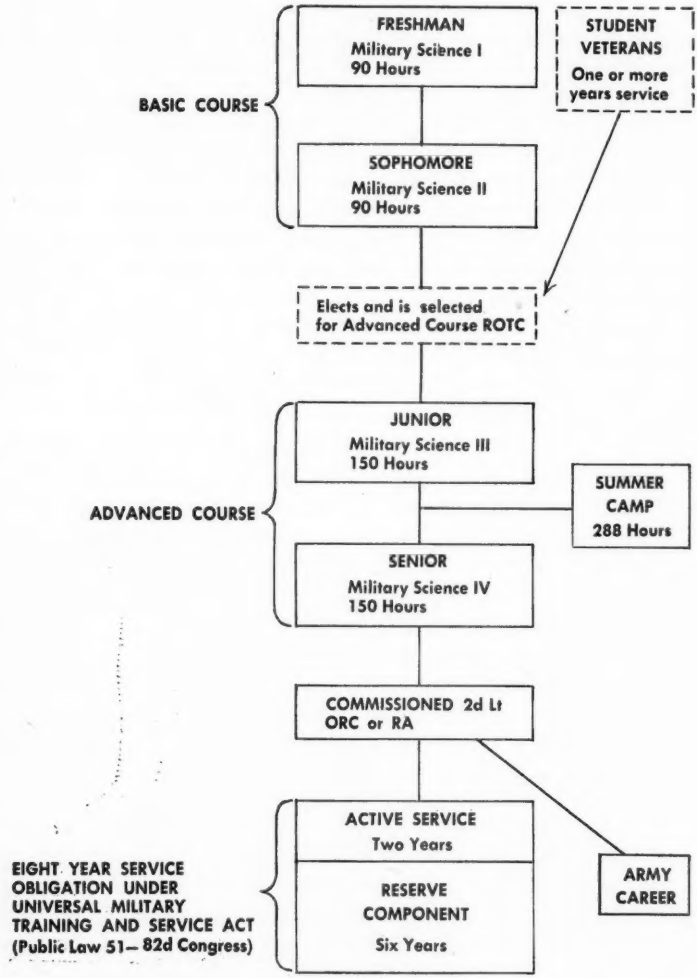
broadcasts a fifteen-minute program each weekday called "*Sprechen Sie Deutsch?*".

Mutual understanding and respect between peoples are best built by actual knowledge of each other and each other's ways. This is being attained to a great extent through newspapers, radio and other communications media, both civilian and military. Great strides have also been made in the establishment of German-American Clubs, notable among which are the women's groups devoted to welfare projects. Nearly every city or town of any size boasts jointly operated clubs and organizations which bring together amateur musicians, photographers and sports enthusiasts for discussion of their hobbies. *The Stars and Stripes*, unit newspapers and American Forces Network co-operate by publicizing times and meeting places of German- and French-American clubs and other combined activities. During the 1951 Christmas season great numbers of needy German children were fed and entertained by American servicemen; German families, in turn, opened their homes to American servicemen and many a lasting friendship resulted. (See "International Amity Is This Club's Aim," page 29.)

The education of the German population regarding the United States and her people has not been neglected either. Established originally under the Office of Military Government of the United States and continued by the United States High Commissioner to Germany (HICOG), information centers called *Amerika Hauser* are in operation throughout the United States Zone. These centers are usually staffed by at least one American and an adequate staff of English-speaking German assistants. There German residents of the community, along with peoples of other European countries, may spend pleasant and fruitful hours browsing through books, pamphlets and other information media. They are encouraged to ask questions about the United States, its history, government, politics and economic development; however no effort is made to "stuff democracy down their throats." Attendance at these centers shows a constant upswing far surpassing the founders' fondest hopes.

With the occupation role a thing of the past, now more than ever before the efficiency and security of our units stationed abroad depend to a considerable extent on the creation and maintenance of favorable public opinion. In shaping this all-important opinion, the American soldier-ambassador, aided by a forward looking command-wide information program, is playing a constructive part.

The Making of an ROTC Officer



RESERVE OFFICER TRAINING IN CIVILIAN COLLEGES

LIEUTENANT COLONEL ROBERT D. BURHANS

FIFTEEN YEARS AGO when the college graduate received, along with his diploma, his commission in the Army Reserve, the likelihood of military service seemed remote. Few Reserve Officers Training Corps graduates expected to face a full-time or even part-time military career. World War II and Korea changed that. Today the ROTC graduate with his West Point comrade-in-arms goes directly to active Army service. Approximately 7 percent of each year's ROTC class accept Regular Army commissions as Distinguished Military Graduates.

Participation in college ROTC has reached the highest peak in history. A recent expansion has added twenty-five new colleges and universities to the ROTC family. Currently a record figure of two hundred and sixty-two institutions of college level scattered among the forty-eight states, the District of Columbia, Puerto Rico, Hawaii and Alaska have some one hundred and forty-five thousand students enrolled in ROTC courses. Of these, sixty-six thousand are college freshmen. Allowing for attrition, four years from now about twenty-three thousand of them will emerge as commissioned officers in all of the arms and services.

ROTC graduates made their first big contribution to the Nation's defense in World War II. Two months before Pearl Harbor, some seventy-six thousand, or 67 percent, of the officers then in the Army were Reserve officers and seventy-three thousand of them had obtained their commissions through ROTC study in the 1920's and 30's. At the same time, more than one hundred thousand were in training in one hundred and thirty-seven universities, colleges and high schools throughout the country. In the early stages of World War II up to 90 percent of the officers in troop units, particularly in the company grades,

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consisted of ROTC graduates. Thousands of additional Reserve officers were in administrative and technical positions. Together they shouldered a major burden of the Army's sudden expansion. Speaking of them, General of the Army George C. Marshall said, "These Reserve officers constituted the principal available asset which we possessed at the time. Without their assistance, the program could not have been carried out except in a superficial manner."

From 1942 to 1945, however, Officer Candidate Schools largely supplanted ROTC as a source of commissioned officers. Hence, during the peak manpower period in May 1945, OCS and direct appointments accounted for 72 percent of the Army's newly commissioned officer strength, while ROTC graduates provided only 24 percent.

By 1946, however, ROTC was again the principal officer source. In that year a Department of the Army panel set a goal of 23,200 graduates of whom twenty-two thousand were to receive Reserve commissions and the rest Regular Army commissions. In 1952 the total was raised to 33,700, making it necessary for ROTC to seek room for expansion in the numerous small colleges where it had never before offered courses.

The basic concept behind ROTC goes far back into the Nation's history. In 1819, Norwich University, then known as the American Literary, Scientific and Military Academy, in Northfield, Vermont, inaugurated the first course in collegiate military training under Captain Alden Partridge, a former superintendent at West Point. Later, in 1862, the Morrill Act, which was signed into law by President Lincoln, gave Federal aid to military training in colleges. The Act authorized the Government to grant tracts of Federal land to colleges of agriculture and mechanical arts, and it further specified that a course in military instruction should be given in each college receiving such land grants. The loan of Army equipment and instructor personnel was authorized in later legislation at the turn of the century. Finally, in 1916, ROTC received formal recognition under the National Defense Act; and this Act as amended remains its basic authority.

This recognition of ROTC signified a major change in American policy toward military preparedness. From the Revolutionary War to World War I the Nation had relied on its own rugged ingenuity to meet each crisis after it had developed. It was popularly believed that in time of national danger a million men would spring to arms across the Nation and win

through their own native enthusiasm. This viewpoint, naive though it was, was influential in preventing any build-up of a reservoir of trained manpower. The National Defense Act overturned that thesis. In 1920 the first substantial class of ROTC lieutenants went into the reserve ranks, where they remained available, trained and ready for World War II.

Between 1920 and 1949 approximately one hundred and fifty thousand officers received ROTC commissions. During World War II some one hundred thousand ROTC graduates served in the Armed Forces, ranging in grade from lieutenant to brigadier general.

Today the senior ROTC produces trained, qualified commissioned officers for the Army Reserve, the National Guard and the Regular Army. To qualify for commissions, cadets must complete a two-year basic course, a two-year advanced course and six weeks of summer camp at the end of the third year. During this scholastic training period, cadets who sign a deferment agreement and remain in good academic standing are normally placed on draft deferred status. Upon graduation they go on active military duty for two years, including three months' study in their branch school.

Both the basic and advanced courses offer cadets reasonable aid toward graduation. Basic course students receive their uniforms and free text books. Advanced course students receive, in addition, commutation in lieu of subsistence at the rate of ninety cents a day during the school year. During attendance

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TYPES OF SENIOR ROTC INSTITUTIONS

Type	Academic Level	ROTC Course	Commission on Completion
Military College	Four-Year College	Military Science I, II, III and IV required	Yes
Civilian College	Four-Year College	Military Science I, II, III and IV	Yes
Military Junior College	Two-Year College	Military Science I, II, III and IV	No
Military Institute*	High School and Lower	Military Science I & II	No

* Military Institutes teach the Senior Basic Course for which advance credit may be given in the colleges. They are not counted among the two hundred and sixty-two institutions in the college program.

at third year summer camp the cadet is paid $78 per month and five cents a mile for transportation to and from camp.

As an experiment, ROTC training in a branch general curriculum is being tried out this year in twenty-five colleges recently added to the ROTC program and in a representative number of old-line institutions. If successful, elimination of instruction in specialized branches may be made standard throughout the college ROTC program. Under this system all cadets pursue a uniform course of study without concentrating in any particular arm or branch. At the end of their four years of instruction, cadets will be commissioned in the various Army branches with consideration for three factors—the individual's personal desires, his educational background and the needs of the Army.

Both civilian and military educators have helped shape the branch general curriculum. In May 1952 a group of college presidents and educational association representatives held conferences with staff officers from the Department of the Army and the Office, Chief of Army Field Forces. That same month veteran professors of military science and tactics, working on an OCAFF panel, revised Army Training Program 145-1. Later, curriculum experts from selected colleges and universities

An ROTC cadet learns how to secure a truck in cargo loading exercises which provide practical training. Photo by Author

met in the Pentagon with ROTC staff representatives to formalize the branch general curriculum.

The conferences elicited several important reasons for adopting the branch general curriculum. First, it will encourage more college students to enroll in ROTC training, since under the present system a student can only take the particular branch course offered by his college—a factor which has often discouraged students from finishing the four-year course. Second, the new system will produce well-rounded officers who can serve as combat leaders or administrators and, with additional training in a branch school, as technical officers as well. This is the system which has worked successfully at West Point and Annapolis and is now in force in both Navy and Air Force ROTC programs.

The Army and all institutions establishing new ROTC programs have agreed under contract to grant credits for military training toward a degree contingent upon the student accepting his commission. Finally, in individual cases where the draft deferment agreement does not apply, the student is required to sign an agreement to accept a commission if tendered him before he is permitted to enroll in the advanced course.

All this contributes to the flexibility of the ROTC program as a healthy, productive segment of the Army's officer procurement program. Building upon a sound foundation, the program is rapidly being geared to meet the Nation's need in any future emergency.

U. S. Navy Photograph

The ridged seam along the outside of the sleeve transfers most of the garment's weight from the shoulders to the wearer's wrists and base of the neck.

MAKING WINTER THE NAVY'S ALLY

LIEUTENANT DANIEL BOCKOVER

WHEN NAPOLEON invaded Russia and was caught with poorly clothed troops and over-extended supply lines in severe winter weather, he fulfilled the prediction of the Russian Ambassador in London, who had said, "He [Napoleon] will be surrounded by an army of Cossacks and in the end will be destroyed by our winter, which has always been our loyal ally." Adolf Hitler fared but little better when he attempted to storm across Russia. Once again long supply lines and a winter too cold for the German troops brought the Nazi war machine to a decisive halt.

During World War II, with troops stationed in Alaska, ships supplying the farthest northern outposts, and airplanes crossing the frigid Arctic areas, United States commanders turned their attention to methods of keeping their men warmly clothed to insure continued combat efficiency even in the coldest weather.

Although clothing has always been one of the most important factors determining an army's mobility in winter, military leaders were surprised to learn how little attention had been given the subject. It was probably for the simple reason that, like the weather, everyone talked about it but apparently no one had done anything. There was one man, however, who had written several books on the Arctic and who believed it simple to live in extreme cold if only a few precautions were taken. This man, often referred to as the "Prophet of the North," was Dr. Vilhjalmur Stefansson, famed Arctic expert.

During World War II Dr. Stefansson's Arctic manual, intended for popular consumption, was abridged for Army, Navy and Air Force use to teach men how to survive in the cold. Yet if military personnel had been forced to fight in frigid regions they would have been hard pressed to do so effectively.

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Early in 1948, the Army reported that conditions in the Arctic exhausted 75 percent of a soldier's energy in merely staying alive. Since so little energy remained for useful activity, some commentators concluded that military ground operations under such conditions would not be worthwhile and should be written off as an insoluble problem.

Although the Navy had been experimenting with cold-weather clothing for many years, it was not until October 1944 that the Research and Development Department of the Navy's Clothing Supply Office at Brooklyn, New York, undertook the task of developing clothing suitable for wear by naval personnel in Arctic regions.

The Navy had long been interested in the frigid areas of the earth; it had drilled several oil wells in the Arctic and had sent expeditions to the Antarctic. Now the North Pole had suddenly taken on new strategic significance with reports of Russian expeditions into the Arctic Ocean. It was only natural then that the Navy should conduct experiments to find proper clothing in which its men could live, work and, if necessary, fight with the greatest efficiency.

According to Dr. Stefansson the Eskimos had the secret of how to live in the cold and enjoy it. Study the Eskimo and live as he does, he said, but since the Eskimo dresses in caribou skins and the supply of such skins is limited, it will be necessary to improvise in order to duplicate the protection they afford. Stated in these terms, the problem appeared to be clear-cut—it should only be necessary to prepare a carbon copy of an Eskimo suit using substitute materials.

A typical Eskimo usually wears a costume with either two or three layers of skins. His feet are encased in seal-skin boots and a warm fur hood is worn over his head. Says Stefansson, "Completely dressed for winter in reindeer (caribou) skin, Eskimo style, you have a suit that weighs ten pounds, all garments counted, inner and outer from head to heel. With these garments you can sit outdoors at —50° F. and be practically unaware of the temperature, if no wind is blowing."

In order to get a first hand look at conditions in the Arctic, Navy personnel obtained permission to accompany an expedition to Point Barrow, Alaska. They also arranged for technical observers to make a side trip on ships going on maneuvers in Aleutian waters. A few sets of experimental garments were made up and taken along for evaluation.

In October 1948, the party arrived at Point Barrow where

they immediately set about gathering information. A valuable friendship was soon formed with the senior council member for the village, who had served as a guide for Dr. Stefansson and who was accustomed to introducing novices to the rigors of the Arctic.

One evening while sitting around the fire, the men asked their guide if caribou skins actually were as wonderful as they had been led to believe. With a wry smile, he explained how the fur-clad Eskimo actually fared in the North. Caribou fur is not very durable and must be given constant care; it cannot be cleaned; and as for warmth, the Eskimo apparently doesn't think much of the fur's effectiveness since he stays inside when the weather gets bad. His biggest problems are pacing himself to prevent perspiration and thus avoid getting the furs wet, because when this happens hoarfrost forms; if not removed, the hoarfrost may turn to ice and freeze the wearer.

The Navy party had brought along a large number of garments then being used by the Army, Navy and Air Force. By early December, they had tested over two hundred of these and had concluded that none of them was any good. They were too heavy and cumbersome to be practical or too light to be warm.

Time was important. Half of the winter remained but the Navy experimenters were unable to take advantage of it; they had nothing left to test. This problem was solved by summoning a tailor from the Research and Development Department in Brooklyn. Meanwhile a meeting of all the women in the village was arranged, to be held as soon as the tailor arrived.

In January 1949 the tailor reached Point Barrow. Quickly he was conducted to a native hut which had been transformed into a small factory. The native women were crowded into one end of the hut where they jabbered incessantly while staring in wonderment at the new electric lights. The tailor was called on to give a demonstration of an electric sewing machine. There was a respectful silence as he bowed politely and seated himself. Then pandemonium broke loose, with the women emitting shrieks of delight, pointing their fingers and choking with uncontrollable laughter.

None of the men knew exactly what was happening. Envisioning himself as something of a star, the tailor stood up and, smiling broadly, took several deep bows. The uproar continued until the guide stepped forward and took charge. Holding up his hand, he commanded silence. Then without a word, he seated

himself, took a piece of cloth and ran it through the sewing machine at full speed. This done, he stood very erect and proud, folded his arms and motioned the tailor to continue with his demonstration.

Later, the guide explained what had happened. The demonstration was arranged in order to secure Eskimo seamstresses. But no one had considered what would happen the first time the Eskimo women saw a man doing "a woman's work." In the Arctic a man has to be big, tough and fierce if he is to survive and support his family. To see a man sewing was unthinkable, until the natives saw their leader sit down at the machine.

After that, the tailor had all the expert assistance he needed. The Eskimos were mechanically inclined and quickly learned to operate the machines. Clothing in various combinations of fabrics and in countless designs was turned out. During the few months remaining, a true insight into the problem was gained, and a clue as to how it could best be solved.

There are three essential attributes required in clothing designed for Arctic wear. It must be comfortable; it must be durable; it must afford protection against all the elements. This last requires a type of clothing that can be worn in the muddy spring, the comparatively warm summer and the bitter cold winter when the temperature drops to —65° F. Aboard ship it must protect men from the lashing winds and waves.

Keeping the body warm in general is one thing, but protecting the exposed parts—the hands, feet and face—is something entirely different. Past experience indicated the necessity for encasing the feet in several pairs of wool socks before putting on over-sized shoes. Rubber boots were considered strictly taboo in the Arctic because they reputedly conducted the heat away from the feet. The hands were covered with a few pairs of heavy mittens. If a man had to work with his fingers while repairing equipment, he wore gloves inside the mittens. Thus a gloved hand could be withdrawn from the mitten for a few minutes' work, then re-inserted until the hand was warm again.

As far as the face was concerned, very little could be done. Face masks either interfered with breathing or froze as moisture collected from the breath. Care even had to be exercised not to pull the parka hood too far forward lest breath moisture form a ring of hoarfrost and freeze the cheek bones.

Proper tailoring obviously was the key to comfort. Existing garments consisted of several layers of cloth stitched together,

or several garments worn one on top of another. Little attention was paid to tailoring. As a result the clothing would bind, particularly at the shoulders, across the back and at the knees. Bulk binding and weight made clothing uncomfortable and actually lowered a man's efficiency.

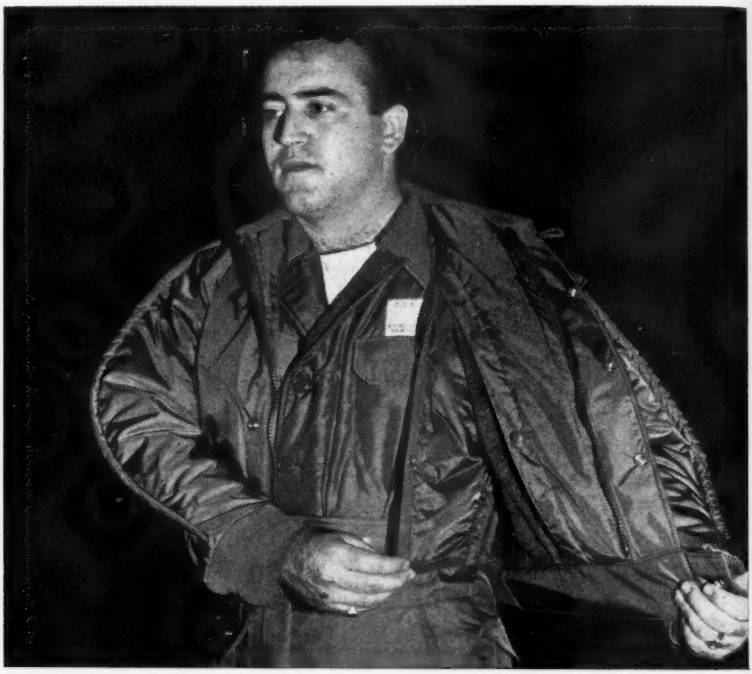
Durability called for consideration of initial cost and length of service. If there was a choice of materials, the longer lasting would be selected, despite higher cost, if long-range savings would result. Strangely enough, many of the materials generally in use at the time failed to meet these standards and were discarded in favor of newer fabrics, especially synthetics such as nylon. The investigators were chiefly concerned with how well the fabrics could withstand laundering or dry cleaning and normal wear and tear. Some fabrics became hard or brittle when exposed to extreme cold. A plastic raincoat became stiff and tore like paper when the temperature hovered around 25° below zero.

While mulling over the problems of comfort, protection and durability, the experimenters began investigating the "moisture barrier" theory. The Canadians were experimenting with this new method of disposing of perspiration by placing a waterproof layer of clothing close to the body to collect the perspiration and to keep the heat in. But apparel so designed was too uncomfortable to be worn. Those who tested it complained that they constantly felt cold and clammy. Disposal of perspiration was quite a problem since a man may perspire up to four and one-half pounds of water over a ten-hour period.

At this point the investigators proposed their own theory—a departure which held high promise. They would simply collect the moisture inside the clothing where it would liberate heat as it condensed, yet they would keep the garment dry next to the skin. This could be done, they reasoned, by erecting a vapor barrier as in the Canadian system but by so locating the barrier that the body would not experience that wet and clammy feeling. Experiments had shown that the temperature between the layers of clothing dropped steadily from the space next to the body to the space just inside the parka. For example, between the skin and underwear the temperature might be 85° F., between the underwear and jacket 40° F., between the jacket and parka —1° F., while outside temperatures were —20°.

An experimental cold room at the Research and Development Department of the Clothing Supply Office permitted testing of proposed garments in the summertime. The experimenters

turned out a uniform that had the parka waterproofed on the inside and sent a man into the cold room to test it. The results were amazing. As the man exercised, perspiration poured from his body. It filtered through the underwear and jacket and froze on the waterproofed inner surface of the parka. When the man became too warm, he merely opened his parka and brushed out the ice crystals.



The waterproof inner lining of the parka may be quickly detached for removal of ice crystals. U. S. Navy Photograph

Not only were the investigators able to devise a series of garments that promised to provide adequate protection; they also succeeded in solving the problem of making the clothing comfortable. To keep the parka from hanging on a man's shoulders, a special type of ridged seam was sewn along the outside of the sleeve, forming an arc from a point at the base of the neck to the wrist. The parka was fitted fairly snug about the waist, and together these three points of contact—base of the neck, the wrists and waist—eliminated the feeling of dead weight. The trousers were binding at the knee but a new tailoring approach eliminated this problem also. Excess cloth

was worked into the front section of each trouser leg, producing a pouched knee. When the knee was bent the excess cloth unfolded, accordion fashion, to prevent any binding.

It also became clear that rubber boots were the only thing that could be used throughout the year in the North where men had to contend with icy waters and thick mud, in addition to the ice and snow of winter. The idea was to construct a boot with sealed insulation, which would prevent moisture from penetrating the insulating layers.

Industry was called upon for assistance but the manufacturers of rubber goods were skeptical as to whether the proposed boot could even be made. Faced by many critics, and with no training in rubber production, the Chief of the Environmental Section turned out models of the proposed boot by hand. His perseverance attracted the attention of a major rubber company which agreed to produce experimental models.

By the autumn of 1949, two series of garments had been devised and quantities were made up for testing that winter. Several sets were sent to the civilians at Point Barrow for their comments; the others were sent to selected ships of the Second Task Fleet underway in Arctic waters. A textile technologist was stationed aboard each of the selected ships to supervise the tests. Daily he selected members of the crew as test subjects to insure that a representative cross section would be obtained of all work regularly performed on deck.

The cruise was only three weeks in duration and the weather was unexpectedly warm, so that adequate tests could not actually be made. However, a few worthwhile observations were noted. Clothing worn at sea had to be waterproof and not merely water-repellent as were the test garments. Also a hood with a fur ruff proved impractical since the sea spray soon had it wet and freezing. The boots with sealed insulation were promising but were quite cumbersome and a new design was considered desirable. In addition, the technologists suggested eliminating the zipper used to fasten the boots, since the metal collected ice and jammed. Members of the crew were unanimous in praising the light weight and freedom of movement afforded by all of the experimental garments.

Late in November the ships returned and the technicians pooled the information they had obtained. A few changes were made in the garments before proceeding with the next field tests at Mount Washington, New Hampshire, where the facilities of the Army Test Detachment and Weather Station were

used. Here the temperature varied from 28° to —25° F., with winds whistling up to one hundred and eighty miles per hour. Army men wore the test garments on a number of hikes, exposing them to the most harrowing conditions.

At this time the Navy ensembles consisted of rubber boots with sealed insulation, cotton socks, two-piece underwear of cotton and vinyon, nylon trousers lined with nylon fleece, nylon fleece inner jacket, nylon outer jacket with a detachable acetate lining, and a hood lined with heavy nylon pile.

The hood was equipped with a new device to protect the face. Stiff pieces of fabric were attached to form a forward extension projecting from the face much like an inverted funnel, with air for breathing drawn in through a small opening at the end. Since the top of the device fitted snugly over the bridge of the nose, only the eyes were left exposed. An effort was made to protect the test subjects by attaching a plastic shield, but the extreme cold made the plastic brittle and it broke too easily to be satisfactory.

During their short stay at Mount Washington, the investigators were convinced that their face mask would protect a man's face from freezing; it was also apparent that a single pair of trousers was inadequate to withstand the bitter blasts.

Accordingly, they began working on a uniform incorporating two pairs of trousers. The boots were found to be highly satisfactory; some redesigning was necessary to provide more arch support and boot laces were substituted for the zipper method of closing. Additional work was also done on the face shield.

To put the entire business of designing clothing on a more scientific basis, work was carried on in a new cold weather chamber where temperatures as low as —70° F. and powerful winds could be generated. Humidity could also be controlled to produce any weather condition desired, from hot to cold and from rain to snow. Here sensitive thermocouples could be attached to a test subject's hands, feet, face and chest. Wires from the thermocouples were connected to sensitive instruments outside the chamber where the actual skin temperature was recorded. All guesswork was thus eliminated.

Further steps were taken to perfect a double set of trousers, the under pair being made of nylon fleece and designed to be fairly form fitting. The trousers fitted inside the boots; snap fasteners at the cuff prevented the trouser legs from riding up out of the boots. The outer pair was worn over the boots and an adjustable strap at the cuff kept out the snow.

Greater warmth was secured by discarding the nylon fleece used in the inner jacket. With these changes, a man could wear the outer trousers and outer jacket until the temperature dropped to around zero, at which time the inner jacket and trousers could be added. Another innovation was a frost-free zipper made of nylon.

A piece of soft wire was sewn in the brim of the hood so that it could be easily shaped to deflect wind or snow. In addition the pieces of material attached to form the funnel-like forward extension were also redesigned, so that they could be pushed back into the hood when not in use. When needed they could be moved forward and snapped together.

Actually very little could be done for the hands. Mittens were waterproofed, lined with nylon fleece, and then gloves were worn inside the mittens.

In the winter of 1950, a new series of clothing items had been prepared and sent to the fleet. These new items received high praise and men of the fleet asked "How soon will these garments be issued for everyone?" The news was encouraging, but to make certain that this was indeed the answer to the cold weather problem, the garments were again tested at Mount Washington. Once more they met with enthusiastic acceptance. From an engineering viewpoint, the clothing was good for a minimum of —40° F. in heavy gales. The clothing actually had been successfully worn at lower temperatures.

In July 1951, the uniform was approved by the Secretary of the Navy for standard Navy issue. The rubber boot with a slightly modified sole was also adopted by the Army and Marine Corps; and the Canadian Army ground forces adopted a cold weather boot based on the same principle of sealed insulation. The boot was placed in mass production to be ready for issue to our troops by the time winter settled in Korea.

The men at the Research and Development Department have not stopped working, however. Their goal is a uniform that they can guarantee will protect a man at temperatures even lower than —40°F. Their pioneering work in this field continues. Some day it may prove invaluable in enabling this country to defend its possessions in the Arctic. Back in 1948, Dr. Omond M. Solant, then head of Canada's Defense Research Board, put it this way: "Today everybody knows it is impossible to fight a war in the Arctic, but we have to prepare for the man who doesn't know it is impossible."

STREAMLINED CHART AND MAP MAKING

ONLY A FEW HOURS previously the enemy-held village had been softened up by an aerial raid. Yet the infantry captain with the aid of a newly overprinted map was able to brief his company on exactly what conditions they would face—which routes were blocked, which strongpoints destroyed—as they moved in for the assault. The map which he used had been reproduced by presses located within sound of the front-line guns. The aerial attack itself had been carried out by pilots equipped with the latest charts printed on presses which have been especially developed by both the Army and the Air Force to keep up with the ever-increasing need for maps, charts and photomaps in modern warfare.

During World War II the Corps of Engineers turned out forty thousand different maps for a total of four hundred and ninety-one million sheets. This volume was produced by Engineer Topographic Base Battalions, Army Map Service and mobile map reproduction units operating in the field in motorized van type trucks. Commercial equipment with few, if any, adaptations or modifications was largely used.

At the Army's Engineer Research and Development Laboratories at Fort Belvoir, Virginia, new improvements are being made today in reproduction equipment designed specifically for military use anywhere in the world. One development is a lithographic offset press; another is a spirit duplicator. The Air Force also has developed a lithographic press, somewhat larger in bulk and heavier than that of the Army, for on-the-spot reproduction of aerial charts, maps and reconnaissance photographs. All of the new equipment is designed to be packaged in self-contained crates for swift shipment by aircraft or for transport and operation in mobile vans.

The press designed by the Army Engineers is both smaller and lighter than the Big Chief of World War II fame although it prints a larger sheet. The new press measures just under five feet in height, is seventy-two inches long and weighs 5200 pounds. Military maps, charts, line and halftone work in single color—or in several colors by successive printings, all in hair-

line register--are possible with the press. Speed of reproduction is variable from twenty-five hundred to five thousand sheets an hour. The press will handle paper stock ranging in size from 11x17 inches to 22½x30 inches; it will print on paper ranging from onionskin to six-ply card. The unit is fitted with wheels so that it may be moved without dismantling.

The Air Force press was designed by a commercial firm on request of the Aeronautical Chart and Information Service. It is a slightly modified standard lithographic offset press, five feet eight inches high and covering an area of seven feet two inches by nine feet eight inches. The press is mounted on skids or runners and is ready to be transported. The entire unit weighs about nine thousand pounds and can be loaded with two fork-lifts into a cargo plane.

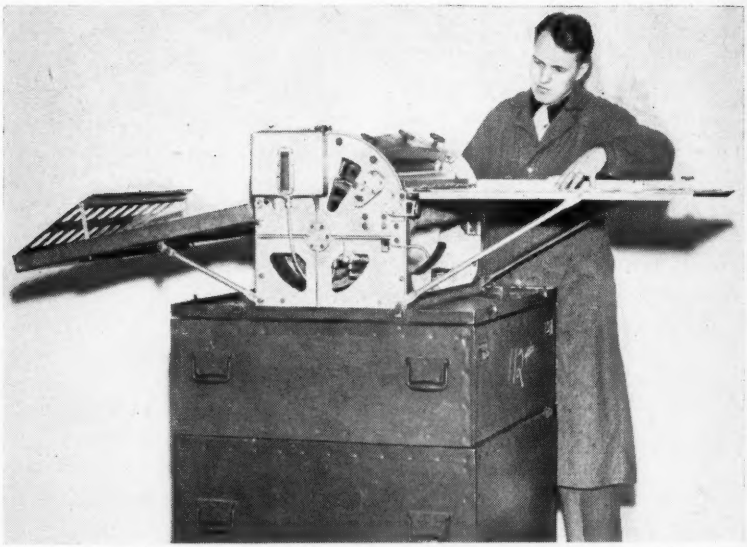
Both Army and Air Force presses are capable of producing complicated multi-colored topographical maps and Target Complex Charts of photomaps (mosaics). The maps and charts show ground contours, roads, railroads, rivers, streams, lakes, bridges, buildings, towns, mines, excavations, airports and timberland of an area. The mosaics are composite aerial photographs which are used to portray bomb damage, possible enemy concentrations and all structures and roads.

To operate each lithographic press, a crew of two is necessary. Specialists are trained at Fort Belvoir in an eight-week course, then get further on-the-job training to become experts.

Lithographic reproduction differs from printing by type or letterpress such as is usually employed in newspapers or magazines. Essentially the lithographic process is based on the principle that grease and water do not mix. The printing design is first drawn or deposited as a greased image on the surface of a lithographic plate. When moisture is applied to the plate, it is repelled by the grease design but dampens the remaining areas. A grease ink is next applied to the plate with an ink roller. The greased image attracts the ink from the roller while the dampened areas repel the ink. The ink received by the plate is then transferred to a rubber blanket which in turn transfers the ink to the paper. Hence the derivation of the term offset, since the plate itself does not touch the paper but rather transfers the ink by offset to the rubber rollers. A separate plate and ink is provided for each color desired.

Such a process is especially efficient for reproducing maps or mosaics since, unlike the letterpress method of printing, it is not necessary to employ time-consuming etching processes.

The new spirit duplicator designed by the Engineers is capable of speedily reproducing maps in the field in situations where lithographic reproduction is either impractical or unnecessary. Hand operated, it can print up to four colors on paper up to 22x29 inches. Special color carbons of purple, red, blue and green are used in drafting a master copy which is then placed in the machine's revolving drum. Paper is fed through spirit dampened rollers before it is brought into contact with the master copy under pressure and then is delivered to the receiving chute in finished form. Printed material shows an accuracy of register within a thirty-second of an inch.



The Engineer-developed spirit duplicator can reproduce up to two hundred maps in four colors. U. S. Army Photograph

The duplicator uses a variation of the familiar gelatin process of reproduction in which inks or pencils are used to draw an image directly onto a master paper which then is transferred onto a gelatin pad. This surface is then moistened with water so that when the paper is pressed against it, the image is transferred to the copy paper.

The new process uses alcohol as the dampening medium and a dye original prepared by typing, writing or drawing on a special type carbon paper. Under the older gelatin method, it was difficult to produce more than fifty copies—and besides the gelatin deteriorated when exposed to heat. The spirit dupli-

cator has been operated satisfactorily at temperatures ranging from 25° to 125° F. Under normal conditions it will furnish two hundred copies of map overprints on a high wet-strength map paper, or a hundred copies of map overlays on map overlay paper.

If maps are important to ground forces, aeronautical charts are vitally necessary to aerial navigators for without them, aircraft would quickly lose their bearings. Navigation charts are the life insurance of every airman.

In preparing charts for the Korean action, the Air Force finds that it can do most of its chart work in Japan at installations close enough to operations headquarters to be efficient.

At present the 548th Reconnaissance Technical Squadron in Japan is being called on to produce the highly informative LORAN charts utilized by the Air Force. LORAN is the abbreviated designation of a system of electronic navigation called Long Range Aid to Navigation. LORAN positions are established by electronically measuring the millionths of a second difference in the time it takes a radio signal to reach an aircraft from two different stations. By crossing the line of position with another line from another pair of stations the pilot or navigator can determine the exact position of the aircraft over the earth. But without proper charts the system cannot be used.

Recently when new LORAN stations were put into operation in the Far East, new charts covering almost a million square miles had to be produced within two weeks—and what is more, fifteen hundred copies of each of the nine new charts had to be ready for distribution to Air Force crews.

To prepare even a single-color chart requires many technical processes in cartography, photography and lithography. Yet aeronautical charts require many varicolored features so that a navigator may easily pick the different types of vital information—LORAN lines of position, elevations of mountains, various types of landmarks. To imprint the many distinctive colors on a chart requires a press run for each color. Thus it is actually necessary to prepare a master chart for each printing run, and each one must fit the other exactly. At a scale of 1 to 100,000, a difference of a tenth of an inch would represent a serious error; accuracy must therefore be measured in thousandths of an inch.

Because paper and photographic film expand or contract, depending on temperature and humidity, all drawing is done on paper which is rigidly mounted on masonite boards. A light-

sensitive coating is applied, a negative of the lines of latitude and longitude is exposed onto the drafting, and the image, after development, appears in light blue. One of these "blue-line boards" is made for each of the colors in the final chart.

Points of intersection of the LORAN lines and lines of latitude and longitude are delicately plotted on the blue-line boards with lines from each pair of stations drawn on a different board. The boards are then ready to be translated into a plate. On a camera a negative is made. The film fades or screens out the light blue lines but photographs the black lines. Data designed to appear in specific colors have been plotted on separate boards; thus each negative includes only markings which will appear in that color press run.

The image from the negative is transferred to a lithographic plate of grained zinc or aluminum. The grained plate, covered with a light-sensitive coating and placed in a vacuum frame with the negative over it, is exposed and prepared for the press.

An airman adjusts a time clock for proper exposure during the "burning in" phase of producing a chart plate. U. S. Air Force Photograph

From these plates the presses begin turning out copy after copy of the necessary charts for delivery to the Aeronautical Chart and Information Service for distribution. These charts will enable aircraft of the Far East Air Forces to fly to any destination, at any time, in any weather.

Aided by aerial reconnaissance maps and photographs quickly reproduced by offset printing processes and the new mobile printing presses, Army ground commanders, too, will be able to chart the path to more effective and efficient operations.

LEGISLATIVE REVIEW

LEGISLATION of military interest enacted during the second session of the 82d Congress includes the following:

Home and Farmhouse Loans to Veterans (Public Law 325—82d Congress). Authorizes a $25,000,000 addition to the revolving fund (plus amounts up to $25,000,000 for each quarter from 1 July 1952 until 30 June 1953, less sales of loans returned to the revolving fund) for the purpose of making direct loans under the Serviceman's Readjustment Act for housing at 4 percent interest rates where such loans are not available from private sources.

Armed Forces Pay Raise Act (Public Law 346—82d Congress). Effective 1 May 1952 amends the Career Compensation Act of 1949 to provide the following rates of pay:

COMMISSIONED OFFICERS

YEARS OF SERVICE

Pay grade	*Under 2*	*Over 2*	*Over 4*	*Over 6*	*Over 8*	*Over 10*	*Over 12*	*Over 14*	*Over 16*	*Over 18*	*Over 22*	*Over 26*	*Over 30*
O-8	$963.30	$963.30	$963.30	$963.30	$963.30	$963.30	$963.30	$963.30	$963.30	$963.30	$963.30	$963.30	$992.94
O-7	800.28	800.28	800.28	800.28	800.28	800.28	800.28	800.28	800.28	800.28	800.28	829.92	859.56
O-6	592.80	592.80	592.80	592.80	592.80	592.80	592.80	592.80	607.62	637.26	666.90	696.54	726.18
O-5	474.24	474.24	474.24	474.24	474.24	474.24	489.06	503.88	518.70	548.34	577.98	607.62	607.62
O-4	400.14	400.14	400.14	400.14	414.96	429.78	444.60	459.42	474.24	503.88	518.70	533.52	533.52
O-3	326.04	326.04	340.86	355.68	370.50	385.32	400.14	414.96	429.78	444.60	459.42	459.42	459.42
O-2	259.36	274.18	289.00	303.82	318.64	333.46	348.28	363.10	363.10	363.10	363.10	363.10	363.10
O-1	222.30	237.12	251.94	266.76	281.58	296.40	311.22	326.04	326.04	326.04	326.04	326.04	326.04

WARRANT OFFICERS

Pay grade	*Under 2*	*Over 2*	*Over 4*	*Over 6*	*Over 8*	*Over 10*	*Over 12*	*Over 14*	*Over 16*	*Over 18*	*Over 22*	*Over 26*	*Over 30*
W-4	$332.90	$332.90	$332.90	$348.04	$363.17	$378.30	$393.43	$408.56	$423.70	$438.83	$453.96	$469.09	$484.22
W-3	302.64	302.64	302.64	310.21	317.77	325.34	332.90	340.48	348.04	363.17	378.30	393.43	408.56
W-2	264.82	264.82	264.82	264.82	272.38	279.95	287.51	295.08	302.64	317.77	332.90	348.04	363.17
W-1	219.42	219.42	219.42	226.98	234.55	242.11	249.68	257.24	264.82	279.95	295.08	310.21	310.21

ENLISTED PERSONS

Pay grade	*Under 2*	*Over 2*	*Over 4*	*Over 6*	*Over 8*	*Over 10*	*Over 12*	*Over 14*	*Over 16*	*Over 18*	*Over 22*	*Over 26*	*Over 30*
E-7	$206.39	$206.39	$214.03	$221.68	$229.32	$236.96	$244.61	$252.25	$259.90	$275.18	$290.47	$305.76	$305.76
E-6	175.81	175.81	183.46	191.10	198.74	206.39	214.03	221.68	229.32	244.61	259.90	259.90	259.90
E-5	145.24	152.88	160.52	168.17	175.81	183.46	191.10	198.74	206.39	221.68	236.96	236.96	236.96
E-4	122.30	129.95	137.59	145.24	152.88	160.52	168.17	175.81	183.46	198.74	198.74	198.74	198.74
E-3	99.37	107.02	114.66	122.30	129.95	137.59	145.24	152.88	152.88	152.88	152.88	152.88	152.88
E-2	85.80	93.60	101.40	109.20	117.00	124.80	124.80	124.80	124.80	124.80	124.80	124.80	124.80
E-1 (Over 4 months)	83.20	91.00	98.80	98.80	98.80	98.80	98.80	98.80	98.80	98.80	98.80	98.80	98.80
E-1 (Under 4 months)	78.00												

Also prescribes new monthly rates of basic allowances for quarters for commissioned officers and warrant officers as follows:

Pay grade	*With dependents*	*Without dependents*	*Pay grade*	*With dependents*	*Without dependents*
O-8	$171.00	$136.80	O-2	$94.20	$77.10
O-7	171.00	136.80	O-1	85.50	68.40
O-6	136.80	119.70	W-4	119.70	94.20
O-5	136.80	102.60	W-3	102.60	85.50
O-4	119.70	94.20	W-2	94.20	77.10
O-3	102.60	85.50	W-1	85.50	68.40

Also prescribes basic allowances for quarters for enlisted members coming under the provisions of the Dependents Assistance Act of 1950 at the following new rates:

Pay grade	*Not over 2 dependents*	*Over 2 dependents*
E-7	$77.10	$96.90
E-6	77.10	96.90
E-5	77.10	96.90
E-4	77.10	96.90

	1 dependent	*2 dependents*	*Over 2 dependents*
E-3	$51.30	$77.10	$96.90
E-2	51.30	77.10	96.90
E-1	51.30	77.10	96.90

Also increases the basic allowance for quarters for enlisted members without dependents (as provided in subsection 302 (g) of the Career Compensation Act of 1949, as amended) by 14 percent.

Increases the basic allowance for subsistence (as provided in section 301 (e) of the Career Compensation Act of 1949) except the amount payable to enlisted persons when permission to mess separately is granted, by 14 percent.

Increases the pay of cadets, midshipmen, and Army and Navy aviation cadets by 4 percent.

Members and former members of the uniformed services entitled to receive retired pay, retirement pay, retainer pay, or equivalent pay computed on the rates prescribed in section 201 (a) of the Career Compensation Act of 1949 shall be entitled to have such pay computed on rates as prescribed by this Act; those entitled to such pay under laws in effect prior to 1 October 1949 are granted a 4 percent increase in pay.

Amends the Career Compensation Act of 1949 to extend the provisions of titles II and III of that Act to those persons not serving as members of any of the uniformed services but whose pay or allowances, or both, under existing law or regulation are assimilated to the pay and allowances of commissioned officers, warrant officers, or enlisted persons of any rank or grade of any of the uniformed services.

Mutual Security Act of 1952 (Public Law 400—82d Congress). Amends the Mutual Security Act of 1951 to authorize appropriations for fiscal year 1953 for military assistance to European countries designated in the Mutual Security Act of 1951, plus additional funds for defense support and economic assistance for Europe, Africa and the Near East area, Asia and the Pacific area, and Latin America. Among other provisions, authorizes $45,000,000 for Korean relief in 1953; also authorizes the Department of the Army to make available $67,500,000 in goods and services to the United Nations Korean Reconstruction Agency, at the time when that agency assumes full responsibility for relief and rehabilitation in Korea.

Authorized Strength of U. S. Marine Corps (Public Law 416—82d Congress). Amends the National Security Act of 1947 to fix the peacetime personnel strength of the Regular Marine Corps at not more than four hundred thousand organized in not less than three combat divisions and three air wings, and such other land combat, aviation and other services as may be organic thereto. Also provides that when matters directly concerning the Marine Corps are under consideration by the Joint Chiefs of Staff, the Commandant of the Marine Corps shall meet with the Joint Chiefs and have co-equal status with them in such matters.

Defense Cataloging and Standardization Act (Public Law 436—82d Congress). Provides for an economical, efficient and effective supply management organization within the Department of Defense through the establishment of a single supply cataloging system, the standardization of supplies and the more efficient use of supply testing, inspection, packaging, and acceptance facilities and services.

Military Personnel Claims Act Amended (Public Law 439—82d Congress). Amends the Military Personnel Claims Act of 1945 to permit the Secretaries of the Army, Navy and Air Force to authorize settlement of claims not in excess of $2500 by military personnel and civilian employees for damage to or loss, destruction, capture or abandonment of personal prop-

erty occurring incident to their service. Permits filing of claims regardless of whether such loss occurred concurrently with, or subsequently to, the death of the owner of the property. Extends the time for filing claims to two years after it accrues or one year after enactment of this law (3 July 1952), whichever is later. Also makes the Act applicable to Department of Defense employees not under jurisdiction or control of the Army, Navy or Air Force.

Retention of National Guard Units and Other Reserve Components in Active Federal Service for Five Years. (Public Law 461—82d Congress). Authorizes the President to retain unit organizations and equipment of the National Guard, Air National Guard and other reserve components in the active Federal service, exclusive of the individual members thereof, for a total period of five consecutive years—instead of the twenty-four month period previously specified—after which the unit designations, together with pertinent records, colors, histories, trophies and other historical impedimenta will be returned to the states. The Secretaries of the Army and the Air Force may provide for the establishment in the various states of units comparable to those retained in the Federal service. Such units as are organized and the members thereof shall be integrated into the respective corresponding unit organizations of the National Guard and the Air National Guard within a reasonable time after the date of release of Federally retained units to state control. The appropriate service Secretaries shall prescribe the strength of such units, which may be changed from time to time, depending on availability of manpower; and they shall also provide for the arming and equipping of such units.

Armed Forces Reserve Act of 1952 (Public Law 476—82d Congress). Space limitations preclude any satisfactory summary of this Act in the DIGEST. The complete text is published in Department of the Army Bulletin 7 (16 July 1952). Details of its implementation will be reported from time to time in regulations promulgated by the service Secretaries.

Combat Duty Pay Act (Public Law 488—82d Congress). Title VII of the Department of Defense Appropriation Act of 1953 provides that members and former members of the uniformed services shall be entitled to receive $45 a month combat pay for each month after 31 May 1950 during which they were members of a combat unit in Korea, provided the combat unit was subjected to hostile ground fire and the person was actually on duty with that unit for a minimum of six days a month.

The Act also provides that no person shall receive more than one combat pay for any month or combat pay in addition to any incentive or special pay. The service Secretaries are authorized to promulgate administrative regulations.

Veterans Readjustment Assistance Act for Korean Veterans (Public Law 550—82d Congress). Grants mustering-out pay, education expenses, on-the-job training, loan benefits and unemployment benefits to veterans of service in the Armed Forces since 27 June 1950.

Provides mustering-out payments to all enlisted grades and officers below the grade of major in the Army who are discharged or released from active duty under honorable conditions after 27 June 1950. Payments are fixed at $100 for veterans with less than sixty days of active service; $200 for those with sixty or more days of active service but no foreign service; or $300 for those with at least sixty days of active service some part of which was outside the United States or in Alaska since 26 June 1950. Military personnel eligible to receive mustering-out payments under this Act, and under the Mustering-out Payment Act of 1944 for the same period of service, shall elect to receive such payment either under this law (PL 550—82d Congress) or under the Mustering-out Payment Act of 1944, but shall not be entitled to payment under both laws.

Among the educational provisions, the Act grants veterans eligibility for one and one-half days of education or on-the-job training for each day of service since 27 June 1950, up to a maximum of four school years or thirty-six months. Veterans of World War II are limited to a total of forty-eight months, less any periods of training received under the Serviceman's Readjustment Act of 1944, as amended.

Payments while training are fixed at $110 for single veterans, $135 for those with one dependent, $160 for those with more than one. The student must pay for his own tuition, books, supplies and subsistence. Training must be started by 20 August 1954 or two years from date of discharge, whichever is later.

Unemployment benefits of $26 a week for twenty-six weeks are available to veterans unemployed through no fault of their own. Veterans receiving mustering out pay are not eligible for such payments for thirty, sixty or ninety days after discharge, depending on the amount received.

Government assistance is available to veterans desiring to secure a loan for the purchase of a house, farm or business. The loan guarantee provision is scheduled to expire ten years

after the declaration of the end of the present emergency.

Social Security Benefits for Veterans of the Korean Conflict (Public Law 590—82d Congress). Section 5 (a) amends the Social Security Act (relating to World War II veterans) by providing benefits for veterans of Korean action. The law authorizes entitlement to monthly benefits based on wages of $160 in each month of service in the active military or naval service on or after 25 July 1947 and prior to 1 January 1954.

Other laws of specialized military interest are listed below:

Public Law	*Title or Subject*
256	Invention Secrecy Act
277	Postal Stations at Defense Installations and Detail of Postal Employees Thereto
303	To Amend War Claims Act of 1948 to Authorize Additional Compensation for Prisoners of War
311	To Transfer Philippine Scouts Hospital and Equipment to the Philippines, and to Provide Grants in Aid for Medical Care for Certain Philippine Scouts Hospitalized Therein
356	To Increase Veterans Compensation and Pensions
357	To Increase Annual Income Limitations Governing Pension Payments to Certain Veterans and Their Dependents
397	To Confirm the Status of Certain Civilian Employees of Non-appropriated Fund Instrumentalities with Respect to Laws Administered by the Civil Service Commission
401	To Amend Soldiers and Sailors Civil Relief Act to Increase Penalties for the Invalid Foreclosure or Seizure of Property
408	To Authorize Appointment of Women Physicians and Specialists in the Armed Forces
410	Special Inducement Pay for Physicians and Dentists
427	To Increase Certain Rates of Veterans Compensation Providing Specific Incurred Disabilities
437	To Extend Certain Patents for World War II Veterans
517	To Provide for Crediting of Certain Service in the Army for Certain Members of Reserve Components of the Air Force
522	To Amend Federal Property and Administrative Services Act
536	To Extend the Veterans Preference Act to 2 July 1955
557	Armed Forces Research and Development Act

With this issue, ARMY INFORMATION DIGEST completes Volume VII. The DIGEST—an official publication of Department of the Army—is published under the direction of the Chief of Information, Major General Floyd L. Parks, USA, and is prepared at the Armed Forces Information School, Fort Slocum, New York under the supervision of the Commandant, Rear Admiral Thomas H. Binford, USN.

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Stand At Bastogne

In early December 1944, the Allied armies were preparing for the main attacks on Germany's frontier defenses. Simultaneously, Marshal von Rundstedt was assembling well-equipped and trained forces to launch a counteroffensive against the thinly held Allied lines in the Ardennes area of Belgium. At 0500 on 16 December, under concealment of cloudy weather, an estimated twenty-four German divisions attacked with devastating surprise. Within three days their rapid advance was threatening to cut Allied command communications.

Allied reinforcements were rushed to the endangered sector, among them the 101st Airborne Division which moved to Bastogne where it was destined to make an epic defense of that position. As the seemingly relentless enemy offensive continued, Supreme Headquarters, Allied Expeditionary Forces issued a General Order on 22 December calling upon every man in the Allied ranks to rise to new heights of courage and resolution and to turn the German gamble into one of their greatest defeats.

Completely surrounded and by-passed by the enemy, the men of the 101st proved capable of meeting the test. Enduring bitter cold and fatigue, and despite inadequate provisions and the persistent siege of the enemy, the Division held its ground.

Rundstedt's drive was finally halted on 26 December after penetrating some fifty miles into Allied territory. That same day the first units of the United States Third Army broke through the German encirclement to come to the relief of Bastogne. By the end of December, Allied strength in the Ardennes forced the Germans to abandon the offensive. This marked the turning point which was to lead to the Allied victory in Europe in World War II.

Reproduced on the back cover is "Main Street, Bastogne," a watercolor by Technical Sergeant Olin Dows, one of the United States Army artists who recorded scenes of World War II. The original is in the Historical Properties Branch, Office of the Chief of Military History, Department of the Army.